THE IRON AGE

New York, March 3, 1921

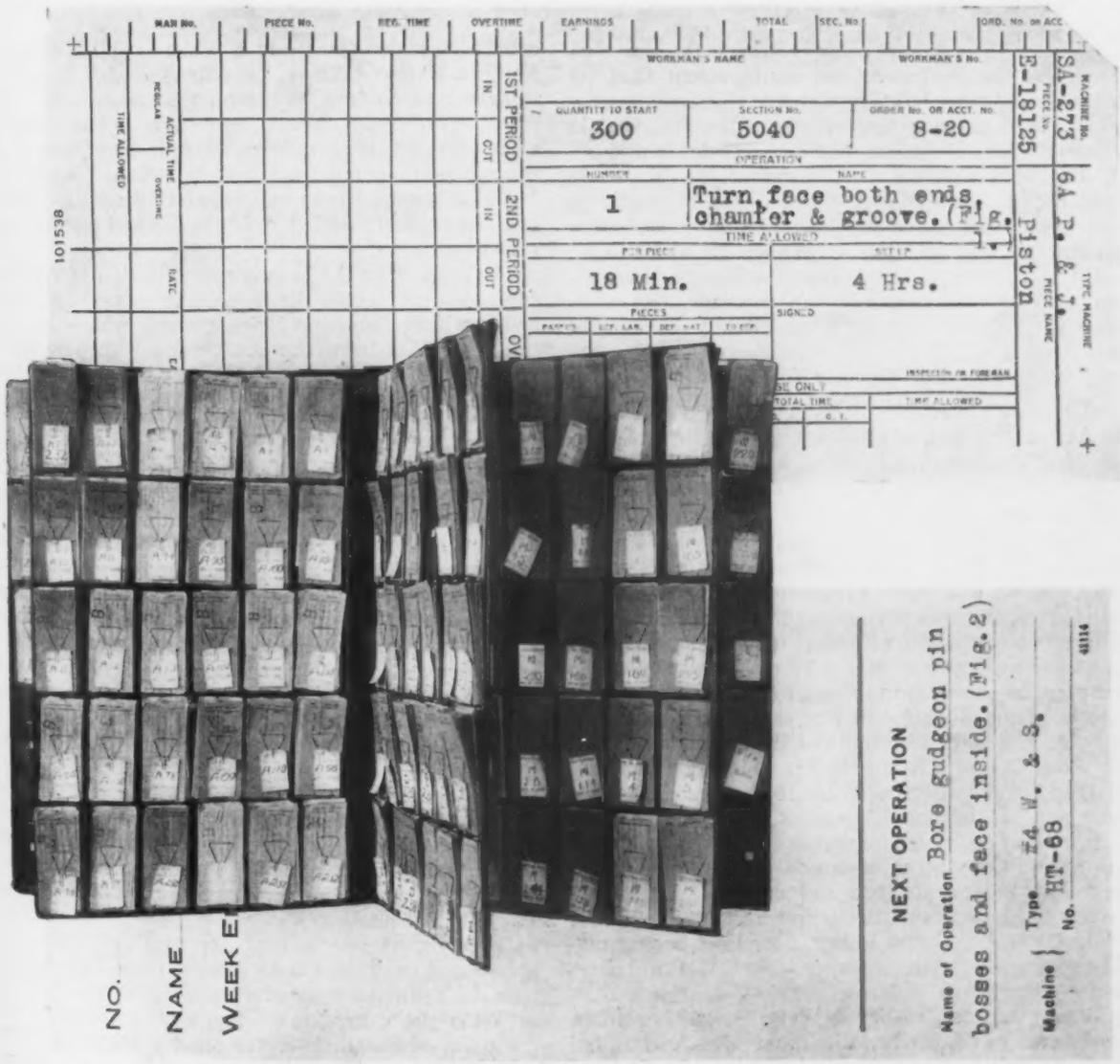
ESTABLISHED 1855 VOL. 107: No. 9

Production Methods of Rolls-Royce Plant

How an Automobile Factory, Operating Along Lines Found Practical in English Works, Schedules Machining of Thousands of Parts

WHEN the Rolls-Royce Co. decided to establish a plant in the United States for the manufacture of its automobiles, there was no thought of attempting to emulate American production methods, except in so far as they might be adopted without raising a question of quality, for which the Rolls-Royce car has, of course, laid great claims. The plant which the Rolls-Royce Co. of America has equipped at Springfield, Mass., is, therefore, a replica of the plant at Derby, England, in all of the essential details.

It was the experience of the company in building



To Keep Every Machine Tool Supplied with Material and Jobs Ahead, a Central Machine Control Board Is Provided, with Pockets Numbered to Correspond with the Machines. Each job card, as the material becomes available, is placed in this central control board in its proper position and the state of work for every machine may be seen at a glance

The job card serves the following purposes: Payroll card for bonuses; instructions for moving to the next operation; a progress record and a scrap record. The design and form of the cards are arranged to be used with a tabulating machine.

ROLLS-ROYCE
OF AMERICA, INC.
MACHINE LOAD CHART

DATE May 20, 1920.

NO. A-104

STANDARD TOOLS ON HAND

TYPE OF MACHINE 4-1/4 Cleveland

SETTING UP AND INEFFICIENCY ALLOWANCE 25 %

MAXIMUM LOAD 288
Net Load----- 216

MINUTES per Chassis.

MATERIAL Specifications	Status	Piece No.	Section	Description	Time Per Chassis	No. Off	Operation Time Per Piece	Time Card Symbol	Started Set Up	Started Production	Stopped Production	Total Time	Special Tools	Quantity Completed
4" Rd. M.S. 3½ Rd.		U-1729	5230	Union Nut Magneto	27-1/2	1	27							
CHNS 3½ Rd.		E-17218	5100	Brake Drum	22	1	22							
N.S. 3½Rd.		G-481	6100	Spherical Nut	18	1	18							
CHNS. 4½ Rd.		G-3529	6050	Dog Clutch	37	1	37							
CHNS. 3½ Rd.		G-3423	6040	1stMo. Pin	41	1	41							
M.S. 3-3/4Rd.		G-2137	6040	Coupling Nut	22	1	22							
M.S. 3-3/8		G-1621	6040	Pulley Center	29	1	29							
N.S.		G-6483	6060	Carrier Plate	24	1	24							
					- 220									

100% Loaded.

In Connection with the Operation Lists a Machine Load Chart Is Used to Determine the Exact Amount of Work That Can Be Performed Upon Each Machine Up to the Limit of Its Capacity, After Allowing for Set-ups and Inefficiencies

airplane engines in this country during the war that convinced the engineers and management that its chasses could be built here with the same painstaking workmanship that has been the standard in England. The F. B. Stearns Co., Cleveland, and the H. H. Franklin Mfg. Co., Syracuse, N. Y., made Rolls-Royce airplane engines to British specifications and under the supervision of British engineers during the war in such a manner as to leave no doubt that, despite the differences between American and British machine shop methods, the work done in England could be practically duplicated here.

American Machine Tools Used

The plant purchased by the Rolls-Royce Co. for its American plant was built originally for the Hendee Mfg. Co., manufacturer of motorcycles. It was occupied later by the Wire Wheel Co. of America, and during a period in the war and afterward was used by the Government for the storage of surplus machinery and equipment. The machine shop is 180 x 320 ft. and there are several other buildings utilized for various purposes, such as heat treating, radiator department, assembly of chassis, etc. The plant was equipped mostly with machines which the company had used in the Franklin and Stearns automobile plants during the war, with such additions as were necessary to round out the equipment. With the exception of a cam grinder, which the company designed and built itself, all of the machine tools used are of standard American manufacture.

Included in the equipment are Warner & Swasey, Libby and Garvin turret lathes, Gridley and Cleveland automatics, Carlton radial drills, Le Blond, Lodge & Shipley and Reed-Prentice engine lathes, Bullard vertical turret lathes, Cleveland boring machines, Porter-Cable centering lathes, Garvin turret lathes, Brown & Sharpe automatics, Foote-Burt drilling machines, Henry & Wright sensitive drills, Hammond radial drills, Cincinnati-Bickford radial drills, Garvin tapping machines, Rickert-Shafer tapping machines, Pratt & Whitney automatic millers, Pratt & Whitney vertical and horizontal profiling machines, Becker and Cincinnati milling machines, Bilton millers, Garvin duplex millers, Osterlein millers, Pratt & Whitney thread millers, La Pointe broaching machines, Pratt & Whitney spline millers, Fellows, Barber-Colman, Lees-Bradner and Brown & Sharpe gear cutters, Rochester gear tooth rounders, Bilton bevel gear cutter, Craftsman miller, Landis plain and crank grinders, Norton and Brown & Sharpe plain grinders, Heald and Van Normal internal grinders, Rivett ball race grinders, Blanchard surface grinders and Heald cylinder and piston ring grinders.

In respect to the large representation of American machine tools, the American plant does not differ widely from the British plant, where American tools also have the preference, although some British equipment is used there.

British Procedure Followed in Most Details

In planning its American production the Rolls-Royce Co. aimed to follow the British procedure in every possible detail. It first brought to the United States about 80 of its trained British mechanics, each one of whom was placed in a position of responsibility. Every machine-tool bay has a foreman who has been thoroughly trained in the British plant, and under him are picked American mechanics, who have been selected, after much weeding, because of their willingness to follow the method of workmanship which the company adopts as its cardinal principle of manufacture.

To familiarize these American workmen with the British product, the company brought over models—some 3000 of them—of every part of the car. Thus the machine-tool operator is given not only a blueprint, but also a working model, from which to acquire a knowledge of what, in the opinion of the management, constitutes a perfect job. These model parts are stored in open racks, within wire cages, at one side of the machine shop, and are passed out to the men when a job is begun, and must be returned when the job is completed.

With the exception of one steel casting, all of the parts of the Rolls-Royce chassis are made from drop forgings. No malleable or other iron castings are used. Even the one steel casting is being modified so that drop forgings may be used in its stead. The forgings are of 3½ per cent nickel, except case hardening steel, which is 5 per cent nickel and low carbon. Every part of the chassis is heat treated.

the heat treatment being varied according to the stress which the part undergoes in use. The heat treating is done after the rough machining operations so as to get uniform sections.

An interesting feature of the exactness with which the work is done lies in the fact that no holes are punched, all being drilled. For example, the frame side members of the chassis are first painted white and then marked out by hand for drilling, so that there may be accurate alignment.

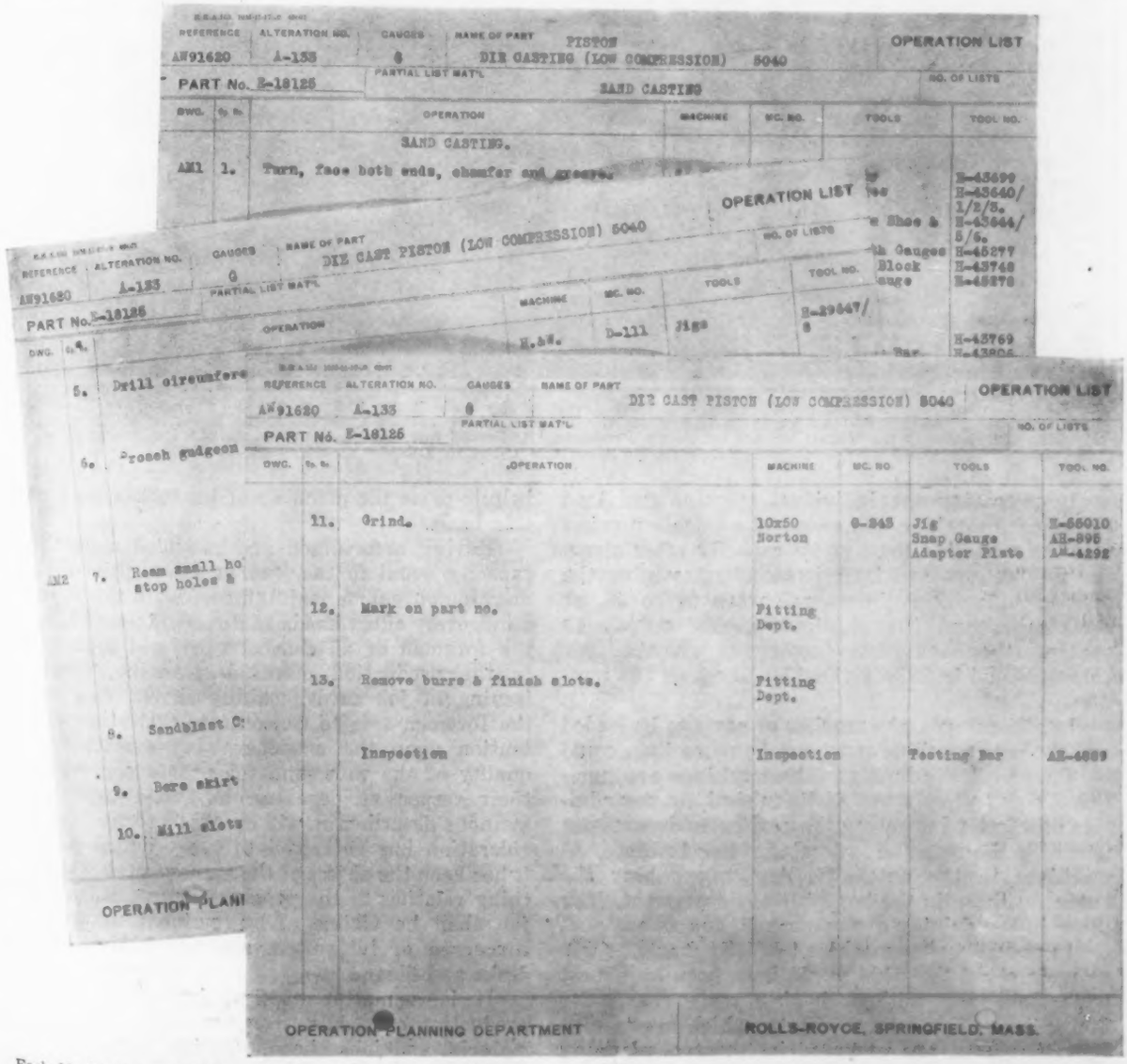
A works testing laboratory is an active department of the plant. A Brinell testing machine is used for hardness and the Stanton testing machine for fatigue strain. Those parts tested for fatigue strain are given 5500 impacts to determine their reliability under driving conditions. For correct determination of heat treatment the Leeds & Northrup transformation point apparatus is used. Raw metal is tested when it comes into the plant, and later the finished form. Symbols are painted on all steel so that the responsibility can be quickly placed upon the steel maker in the case of faulty material or error in the alloy content.

Shop officials of the Rolls-Royce plant state that American mechanics have been found thoroughly efficient. At first some weeding out had to be done until a force of men was employed that would observe the first rule of the plant, attention to workmanship, but now difficulties of this kind seem to have disappeared.

A comparison of costs shows that in some instances parts can be produced more economically in the American plant than in the British plant. The differences are due in part to the restrictions imposed by the British labor unions, which make certain machining costs higher in England. The bonus system is more extensively employed here, resulting in larger production at lower unit cost.

The Rolls-Royce plant got into production in January on a schedule of eight completed chasses per week. A production schedule has been mapped out providing for the completion of 250 chasses by September, 1921. In the manufacture of a standardized product, such as an automobile chassis, in which the number of operations run into the tens of thousands and where the number of machine tools is limited, it is, of course, essential that the machine-tool equipment shall be so balanced that no one part or group of parts will hold back the assembly of the complete chassis by the time scheduled.

In the production plan at the Rolls-Royce works the machine-tool capacity has been determined by calculation of the loads. To ascertain this so-called load a master machine-tool load chart was prepared with the help of a number of experts. This chart embodies every operation on every part, summarized from details charts, each covering a section of the chassis. The time of each operation was laid out against the particular type of machine best suited



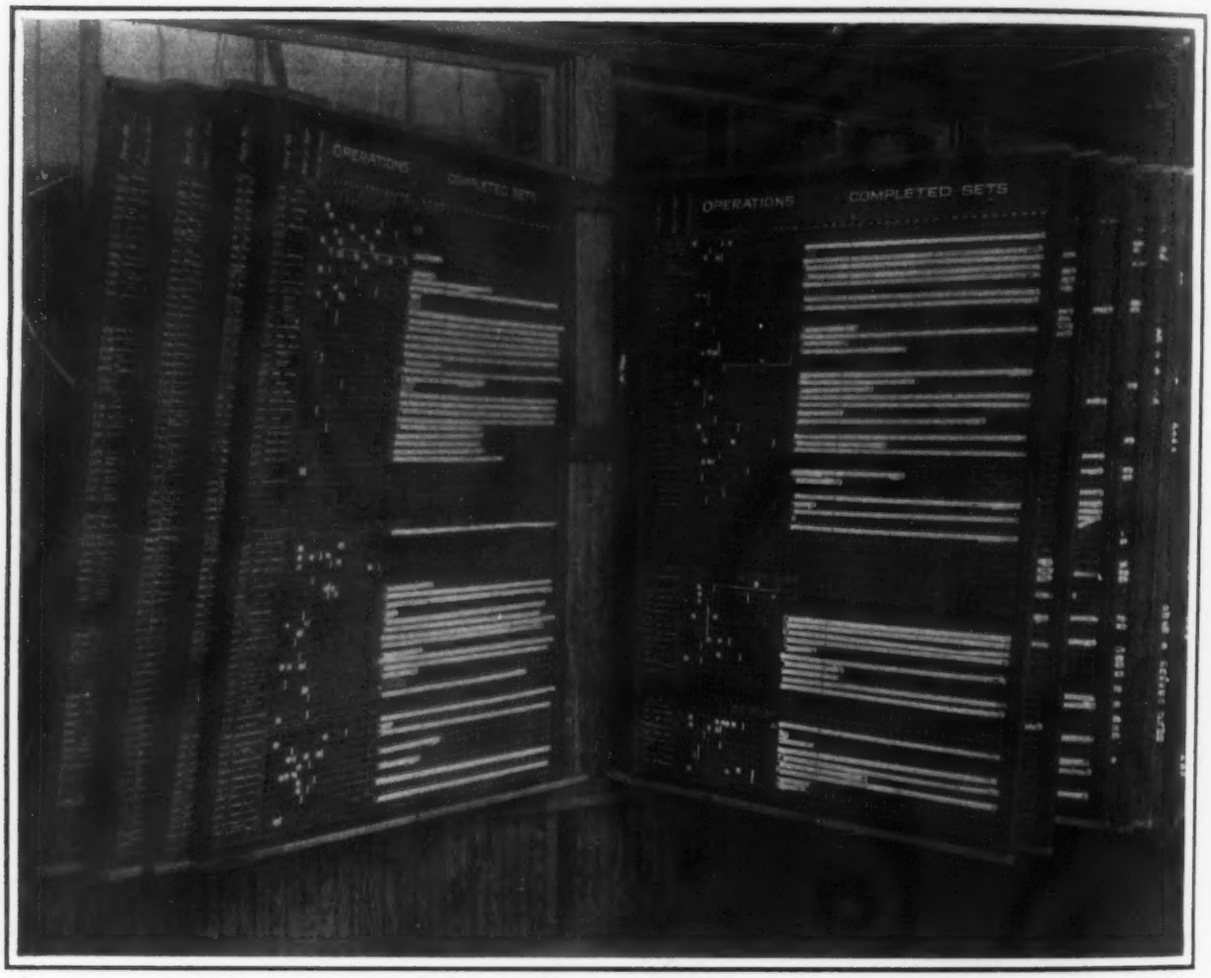
Each Machining Job Is Routed Through the Shop by Means of What Are Termed Operation Lists, Which Show Not Only the Order of the Operations, But Also the Precise Number and Piece Number of the Tools Used in Each Set-up and the Type and Number of the Machine Tool Upon Which the Operation Is Performed

for the work, with allowances for set-up and other factors. The resultant figures showed the aggregate time per type of machine per chassis.

It will be readily seen that such a basic chart would enable one to specify and order the exact number of machines to suit any given output by simply multiplying the time per machine tool by the number of chasses required and dividing by the working time in any given period.

ations but also the precise nature and piece number of the tools used in each set-up, and the type and number of the machine tool upon which the operation is performed. A sample operation sheet is shown herewith. Copies of the operation sheets are distributed to the production office and to the tool crib.

There are, therefore, three factors, viz: Operation times, machine loads, routing of parts, which



Progress Control Boards Enable the Production Department of the Rolls-Royce Plant to Tell at a Glance the Number of Sets Completed, the Number of Parts in Operation, the Number of Operations Completed, the Location of Parts by the Machine Number and the Total Amount of Scrap Produced. Celluloid buttons are used to denote the progress of the parts in operation and are moved from one space to another as the work proceeds

In preparing the individual machine tool load charts each machine was allocated a certain number of parts up to the limit of its capacity after allowing for "set-ups and inefficiencies." Assuming the number of working hours per week to be 48, or 2880 min., and the required weekly output 10 chasses, then the time factor per machine per chassis would be 2880 divided by 10 equals 288 minutes.

In other words, the number of parts to be loaded against each machine must not be more than could be done in 288 minutes. The machines are numbered consecutively but distinquished by the addition of a letter indicating the particular department in which the machine is located. For instance, all machines in the automatic department bear the letter *A;* those in the hand turret department, *HT;* those in the drilling department *D*, and so on.

In preparing the machine tool load charts, it will be understood that this would have been an almost impossible task, without having route charts for each piece. These route charts, which are termed operation lists, are prepared by the tool planning department and are as complete as it is possible to make them, showing not only the order of oper-

help to place the planning of production on a scientific basis.

Having ascertained and provided machine tool capacity equal to the load, it is essential that the machine output be maintained. With this object in mind, every effort has been directed toward relieving the foreman of all clerical work and to centralize in the production office all planning, recording, issuing of job cards, making charts, etc., leaving the foremen free to concentrate their time and attention upon the efficiency of the machines, the quality of the work and the proper supervision of their respective departments. In the production methods described it will be observed that this consideration has entered into every detail. Further it has been the object of the management that everything relating to the progress and position of each job shall be visible and prominent to every one concerned or interested, and not hidden away in desks and files.

It is a matter of first importance that the production office keep every machine supplied with material and jobs ahead. To insure this a central machine control board is provided with pockets numbered to correspond with the machines. Each job

card, as the material becomes available is placed on this central control board in its respective position, and the state of work for every machine can thus be seen at a glance. There are also placed at the end of each bay in a prominent position departmental machine control boards, which are numbered with the corresponding numbers of the machines in that department, and provided with three pockets for each machine. It is the duty of the production office to see that each machine is provided with three jobs ahead, in correct sequence according to the urgency of the job, so that tools, drawings and models may be obtained from the tool crib in advance and thus avoid delays. These departmental control boards are fed from the central control board in the production office.

By this method the foreman is saved the necessity of spending a large amount of his time considering which jobs should be put on next; and as everyone can see at a glance which jobs are scheduled for operation next, it saves time asking questions and thereby harassing the foreman, as is so often the case in shops where no such plan is installed.

Job cards are prepared by the production office in advance for all operations, the operation sheets serving as a complete guide as to the nature and sequence of the operations and the type and number of the machine. The job cards are typed in duplicate, the duplicate being placed on the central machine control board described above when the card is issued to the shop and retained there until the job is completed, thereby indicating the jobs at the machine.

The job card serves the following purposes:

(a) Payroll card for bonus
(b) Instructions for moving to next operation
(c) Progress record
(d) Scrap record.

The design and form of the card are arranged to suit the electrically operated sorting and adding machines on the Hollerith system made by the Tabulating Machine Co. with which the payroll and costs department is equipped.

Completed job cards after inspection and count are returned to the production office, which records progress on progress charts and places the next operation job card on machine control board. The job cards are then passed on to the payroll department for calculating bonus and distribution of costs.

The progress and exact location of each part of the chassis are shown on progress control boards in the production office. These are large framed boards swung from the wall allowing both sides to be used. The number of parts to be dealt with necessitates the use of twenty-four such boards and the parts are shown in sectional or unit order.

The factors covered by these charts include:

(a) Number of sets completed
(b) Number of parts in operation
(c) Number of operations completed
(d) Location of parts, *i. e.*, machine number
(e) Total amount of scrap made.

Celluloid buttons are used to denote the progress of the parts in operation and are moved from one space to another as the work proceeds. The quantity and machine number are shown on the celluloid buttons, thus $\frac{250}{\text{M-115.}}$

A column is provided to show the total amount of scrap which is indicated on yellow buttons. Parts taken for spares are also shown. The progress control boards, therefore, show the exact status of every part, and give at a glance the progress made on each section of the chassis. The value of such a chart in clearly showing backward items and as a means of controlling progress will be apparent.

The moving of material is governed by the job card. It will be noticed that on the reverse side of the job card, the next operation and machine number are shown, which information is transferred to the move tag by the checker and enables the trucker to place the material right up against the particular machine upon which the next operation is to be performed.

It will be noticed that the principle which is applied in the loading of the machines is followed through to the issuing of job cards under machine headings, and to the actual moving of the material to the right machines.

The bonus system in operation at these works is the Halsey premium bonus system, in which the operator and the company share equally in the time saved. In this, as in the production scheme, everything is "above board" and notices are posted around the works which state "No matter how great a bonus is made no reduction will be made on the time allowance under any circumstances other than improvements in the method of manufacture." As each time allowance is made, a record is taken signed by the operator and foreman, which is available to every operator and any one attempting to change a bonus time is liable to dismissal.

Convention and Exhibition of American Steel Treaters

The board of directors of the American Society for Steel Treating has decided to hold the third annual convention and exhibition during the week of Sept. 19 to 24 at Indianapolis. On the State fair grounds is the manufacturers' building, 220 x 360 ft. in size, or with a total floor area of 76,800 sq. ft. The central section, 100 x 240 ft., is known as the sunken garden, and is 20 in. below the level of the surrounding floor space. The management has divided the floor space into 161 sections, 10 ft. x 20 ft. The booths along the north wall are to be used for the live exhibits and are supplied with gas and compressed air, while arrangements have also been made for the exhibitors who require heavy electrical current to be on the promenade on the same side of the building. The floor plan will probably be ready for distribution by March 15, when reservations can be made.

The technical meetings are to be held in the women's building, about 400 ft. from the exhibition hall, where there will be available three or more large meeting rooms for holding simultaneously several sectional meetings.

The Indianapolis chapter of the society is planning for the entertainment of the visiting members and guests. George Desautels, national member of the program and papers committee, is organizing the members of the chapters into 15 committees. The Indianapolis chapter intends to raise $5,000 for entertainment purposes.

The requests that have been coming into the national office at 4600 Prospect Avenue, Cleveland, for information as to reservations and floor plans indicate that the exhibition will be larger than it was at Philadelphia last year, and indications point to an attendance of at least 15,000 people.

Steel Plant Started in Manitoba

The first open-hearth furnace in Manitoba recently commenced operations at Selkirk, about 10 miles northeast of Winnipeg, says Metal Trades of San Francisco. The plant, which represents an investment of about $1,000,000, is known as the Manitoba Rolling Mills. Its equipment consists principally of one 15-ton furnace, three 15-ton ladles, crane and molds. All machinery is operated by electricity by Winnipeg hydroelectric stations. Pulverized Canadian bituminous coal is to be used.

The Country's Pig Iron Making Capacity

In Excess of 51,000,000 Tons Per Annum of Coke Iron—The Next Four Years Call for Twenty Large New Stacks if History Repeats Itself

BY W. W. MACON*

INDICATIONS are that 20 or more blast furnaces need to be built in the next four years. In the last four 30 new furnaces were put into operation and others were enlarged or otherwise remodeled to increase output. The stimulated production of the war period may have given a total of 10,000,000 tons of pig iron beyond the theoretical needs of the period, after allowing for the iron which went into ships to replace sinkings and into shells and other engines of warfare. The underproduction of 1919 and 1920 may have resulted in an offset of 7,000,000 tons to the war's excess, but putting it at 6,000,000 tons and counting on, say, only 65 per cent operation this year, the constantly increasing needs of the country, even though dormant, point to a wiping out by the end of 1921 of the remaining 4,000,000 tons of the 10,000,000 tons war-time increase over charted needs.

A study of the pig iron production over the last 20 years shows an increase in requirements of at least 14 lb. per person every year, or, with the population expanding at the rate of the last decade, an increase in theoretical needs equal to 1,300,000 tons per year (expanding gradually until five years hence it would amount to 1,350,000 tons annually). Based on the performance during the war and on the incentive of demand and high prices since then, the country's dependable capacity at this date for foundry and steel making irons is 140,000 tons per day. As a 600-ton furnace operated continuously at 90 per cent of capacity would produce 200,000 tons per year, the apparent increase in demand would seem to call for 6 or 7 new furnaces every year.

However, the apparent average annual needs for the years 1922 and 1925 inclusive appear to be 40,500,000 tons. This would require a daily output averaged over the year of 111,000 tons. With existing furnaces operating at an everage rate of 75 per cent, 105,000 tons daily would be available from present plants, leaving 6000 tons to be supplied by new blast furnaces. Assuming that these could be operated at 90 per cent of capacity, new furnace capacity of 6600 tons per day would be required. This is equivalent to 11 more furnaces operating every year.

As the commercial incentive is now small, or, expressed otherwise, as furnace building is not expedient, the 11 furnaces would hardly be built in 1921 ready for use in the four succeeding years. Instead, different numbers will be built in different years, but their sum total in terms of the number of years they will each be available for production should be such that the result is equivalent to $4 \times 11 = 44$ furnaces producing one year. Thus five furnaces built every year and ready for use each succeeding year would give an output equivalent to $[5 \times 4\ (\text{yr.}) + 5 \times 3 + 5 \times 2 + 5 \times 1]$ 50 new furnaces running one year. But three might be built in 1921 ready for 1922 business; 6 in 1922 and 5 each in 1923 and 1924. Numerous combinations could be suggested, but the fewer that are built in the early future the more will be required later in

*THE IRON AGE, New York.

NEEDS OF PIG IRON ACCORDING TO RECORDS OF CONSUMPTION PER CAPITA OF POPULATION

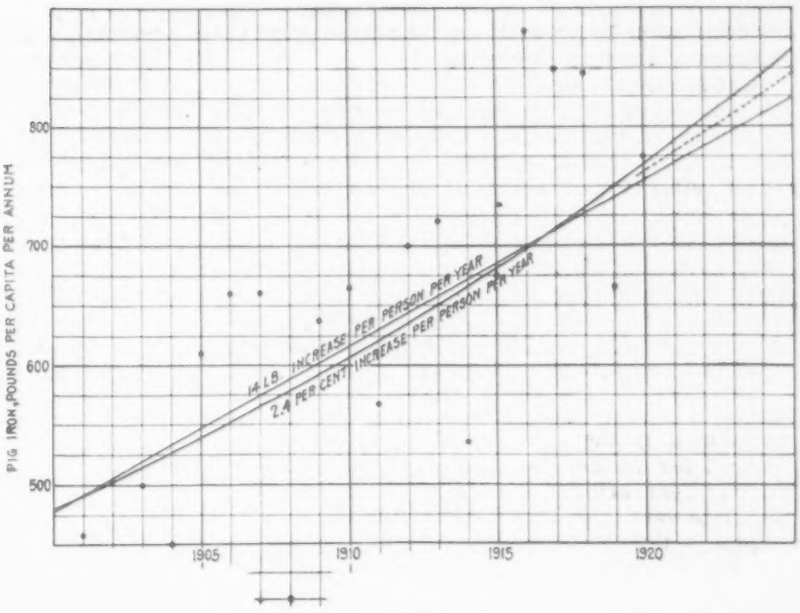
Arithmetical Needs Based on 14-Lb. Increase Per Person Per Year
Geometrical Needs Based on 2.4 Per Cent Increase Per Person Per Year

Years	Yearly Pig Iron Production Gross Tons	Population of United States	Production Per Capita Per Annum Lb.	Theoretical Needs Lb. Per Capita Arithmetical	Theoretical Needs Lb. Per Capita Geometrical	Theoretical Needs Per Annum Millions of Tons Arithmetical	Theoretical Needs Per Annum Millions of Tons Geometrical
1900	13,789,242	75,994,575	406	476	479	16.15	16.25
1901	15,878,354	77,592,344	457	490	490	16.95	16.95
1902	17,821,307	79,190,113	504	504	502	17.85	17.75
1903	18,009,252	80,787,882	500	518	514	18.7	18.55
1904	16,497,033	82,385,651	448	532	526.5	19.6	19.35
1905	22,922,380	83,983,420	611	546	539	20.5	20.2
1906	25,307,191	85,581,189	661	560	552	21.4	21.1
1907	25,781,361	87,178,958	661	574	565.5	22.35	22.0
1908	15,936,018	88,776,727	403	588	579	23.3	22.95
1909	25,795,471	90,374,496	638	602	593	24.3	23.9
1910	27,303,567	91,972,266	665	616	607	25.3	24.9
1911	23,649,547	93,343,350	567	630	621.5	26.3	25.9
1912	29,726,937	94,714,434	701	644	636.5	27.25	26.9
1913	30,966,152	96,085,518	721	658	651.5	28.25	27.95
(14 yr.)	309,453,000					308.2	304.65
1914	23,332,244	97,456,602	535	672	667	29.25	29.0
1915	29,916,213	98,827,686					
1916	39,434,797	100,198,770	676	686	683	30.25	30.1
1917	38,621,216	101,569,854	880	700	699.5	31.30	31.2
1918	39,054,644	102,940,938	851	714	716.5	32.35	32.4
			847	728	733.5	33.4	33.6
(4 yr.)	147,027,000					127.30	127.3
1919	31,015,364	104,312,022	665	742	751	34.5	34.9
(6 yr.)	201,374,000					191.05	191.2
1920	36,650,000	105,708,771	777	756	769	35.7	36.35
(21 yr.)	547,477,000					534.75	532.2
1921	.....	.....	...	770	788	36.8	37.6
1922	.....	.....	...	784	807	37.9	39.0
1923	.....	.....	...	798	826	39.1	40.4
1924	.....	.....	...	812	846	40.3	42.0
1925	.....	.....	...	826	866	41.5	43.6

The Increase in the Consumption of Pig Iron

Records of the production of pig iron indicate that the consumption of pig iron has been increasing in the last two decades at a rate of about 14 lb. every year for every person in the United States. In determining the slope of the line of the trend the years of the war production were not considered. Whereas 476 lb. of pig iron seemingly satisfied each person in the United States in 1900, the figure is now apparently about 756 lb. per capita. The indications are that by 1925 the average individual need will be 850 lb.

The expansion in the use of pig iron over a long term of years is in a geometrical ratio, but the analysis of this expansion indicates that the increase has been at a rate of over 3 per cent per annum per capita. The figures of the last two decades, however, show that this rate of increase has been dropping off, and a geometrical progression for the last 20 years, shown in the curved line, corresponds to a yearly increase per person of 2.4 per cent.



the period. In the calculations it is assumed that the new furnaces could probably be credited with operating at 90 per cent of capacity, in view of the fact that they are likely to be particularly effective producers. It is attempted in this analysis to err on the side of conservatism, as the subsequnt discussion is calculated to show.

There are two definite branches of the investigation. One has to do with present productive capacity, and the other with the trend of demand and the possibility of forecasting from this the needs of the future. A study of the pig iron production statistics of THE IRON AGE shows that in the face of the war stimulus and the commercial incentive since then a total of not more than 378 of the 430 furnaces of the country contributed to the manufacture of foundry and steel making irons. Problems of fuel supply, transportation and labor had their influence, but the fact remains that with attempts to grease the ways to great production many of the furnaces proved to be for one reason or another practically non-existent. Some of the furnaces counted in were producers principally of ferromanganese and spiegeleisen but at times made pig iron. None of the remainder are figured in the country's capacity because, unusual though the conditions were, they were such that these furnaces could be utilized to swell the output.

The production figures show further that in the great activity of the fall of 1916, a time when some furnaces made monthly outputs they have never exceeded since, the daily output arrived at by a combination of the best performances in this period of three months was 126,297 tons per day. New furnaces added meanwhile and new records made by existing furnaces swelled the capacity of the pig iron producing machinery of the country by the fall of 1918 to 135,567 tons per day. Further additions and the pressure for delivery brought the capacity as of March, 1920, to 137,124 tons per day, and at this writing the daily capacity may be put at 140,066 tons. It is to be remembered that these figures are based on the actual output the furnaces of the country have proved capable of and that they allow for the fact that in some groups never was it possible that all furnaces of the group could be operating at one time, such are the practical handicaps of the necessary repairs, relining, plant accessory capacity and the like.

The high daily output of October, 1916—113,189 tons—represents 89.6 per cent of what has been figured as the available capacity at that time, 126,297 tons. Incidentally the year's output showed that the pig iron making plants were run at a rate of 84.6 per cent for the year, undoubtedly a record rate. Similarly in September, 1918, when output averaged 113,942 tons per day, output was 84 per cent of the 135,567 tons apparently possible. The year 1918 showed a 78 per cent rate of operation. In March 1920, the daily output represented 79.4 per cent of the then daily capacity of 137,124 tons.

On the basis of the actual performance it is noted that the average capacity of the 378 stacks is a little more than 370 tons per day. Their total capacity exceeds 51,124,000 tons, which compares with 50,522,500 tons given in the directory of the American Iron and Steel Institute as the capacity of the 430 stacks there listed, including ferroalloys and charcoal iron. Because some of the stacks are always used for the making of ferroalloys and in a few cases they include duplicate stacks never run simultaneously because of insufficient blowing engine or other accessory machinery, the 52 stacks representing the difference between the 430 furnaces in the American Iron and Steel Institute list and the 378 now used at one time or another for general pig iron making may be disregarded in the reckoning, as stated. Incidentally on the basis of the published ratings the average capacity of the 430 furnaces is 322 tons per day.

As to the needs of the country, represented by the absorption of consumption, a charting of the production figures was made to ascertain what if any law could be drawn to evaluate the trend. In plotting, it was decided to use the consumption per annum per capita of population. Such a charting for a long term of years, as, say, from 1800 to date indicates, particularly when plotted on logarithmic cross-section paper, that the individual consumption of pig iron follows closely a geometrical ratio. For the last 20 years of such a curve the divergence of the curve of geometrical progression from the straight line is not great, and it is possible to approximate the apparent gradual increase in consumption of pig iron in this period by a straight line, corresponding to an arithmetical progression, or by a curved line corresponding to a geometrical progression. The statistician's propensity to consider the so-called law of diminishing returns suggests some modification of the curve based on a geometrical progression. Accordingly a mean between the values obtainable on the arithmetical in-

crease and those based on the geometrical increase has been taken as probably better representing the tendency of the next few years.

The accompanying chart shows both the straight line relation and the geometrical relation. To ascertain the curves, use was made of the theory of least squares, thus to establish curves which best satisfy all the production figures on which the curves are based. To exclude the abnormal, the figures for the years 1914 to 1918 inclusive, the years on which the war had an unmeasured influence, were eliminated from the calculations. So, on the basis of the figures of 1900 to 1913 inclusive and those of 1919 and 1920, it was found that the equation for the straight line was

$$y = 14x + 476.$$

In this y is the number of pounds of pig iron needed per person per year and x is the number of the year after 1900. Thus for 1900, x being equal to zero, the number of pounds required per capita is 476.

The equation for the geometrical progression is

$$y = 479 \times 1.024^x$$

Here also y is the number of pounds of pig iron required per person per annum and x is the number of years dating from 1900.

The mean between the values thus obtained ex-

1921, Jan. 1, theoretical surplus, tons	4,000,000
Operation, 65 per cent (140,000 × 0.65 × 365)	33,200,000
Total iron available, tons	37,200,000
Calculated needs 1921, tons	37,200,000
1922, Jan. 1, surplus, tons	000,000
Calculated needs, tons	38,500,000
Two new furnaces (2 × 600 × 0.90 × 365), tons	394,000
Existing furnaces (140,000 × 0.75 × 365), tons	38,300,000
Total supply, tons	38,700,000
1923, Jan. 1, surplus, tons	200,000
Calculated needs, tons	39,800,000
Total requirements, tons	39,600,000
Four new furnaces (2 × 394,000), tons	800,000
Existing furnaces (1922 supply), tons	38,700,000
Total supply, tons	39,500,000
1924, Jan. 1, deficit, tons	100,000
Calculated needs, tons	41,150,000
Total requirements, tons	41,250,000
Eight new furnaces, tons	1,575,000
Existing furnaces (1923 supply), tons	39,500,000
Total supply, tons	41,075,000
1925, Jan. 1, deficit, tons	175,000
Calculated needs, tons	42,500,000
Total requirements, tons	42,675,000
Eight new furnaces, tons	1,575,000
Existing furnaces (1924 supply), tons	41,075,000
Total supply, tons	42,650,000
1926, Jan. 1, deficit, tons	25,000

tended beyond 1920 and marked on the chart shows the apparent per capita pig iron needs.

In the accompanying tabulation of the theoretical needs, the actual production of pig iron in the 14 years before the war, 309,453,000 tons, exceeded the calculated amount by 1,253,000 tons, or by one-third of one per cent. The four active war years of 1915 to 1918 inclusive show an actual production of 147,027,000 tons, or about 19,700,000 tons more than the calculated needs. If one-half of this excess is regarded as that wasted through war uses, or, in other words, not utilized for the progress of the country, there is left about 10,000,000 tons to be absorbed because of the possibility that that amount of pig iron was put into industry ahead of its needs through the false stimulus of the war. For the 21 years from 1900 to 1920 inclusive the excess of pig iron production over the calculated amounts is, according to the straight line relation, 12,700,000 (547,477,000 — 534,750,000) tons. Thus if 10,000,000 tons may be written off as the amount which does not have to be absorbed, there is left an apparent excess of production over consumption needs of 2,700,000 tons. However, for the purpose of this calculation it may be assumed that the year 1921 opened with perhaps 4,000,000 tons more pig iron than was as yet needed. The calculations involving 22 new furnaces may then be made, as shown in the accompanying table.

A recapitulation to show the additional blast furnace capacity needed may be made as follows:

The calculated needs for the seven years ended with 1925 are about 270,000,000 tons. The outputs of 1919 and 1920 and that expected in 1921, plus the remaining 4,000,000 tons of the extra-theoretical production of the war period, make a total for three of the seven years of about 105,000,000 tons. There is thus left to be supplied against the charted needs of the remaining four years of the seven-year period a total of 165,000,000 tons. The fact that three of the seven years are relatively lean justifies the expectation of activity in at least a part of the last four years. To produce 165,000,000 tons means an average of more than 40,000,000 tons per year against no better than about 38,000,000 tons with to-day's complement of stacks working at the unusual rate of 75 per cent of capacity, or 105,000 tons per day. Production for the first ten months of 1920 was at a daily rate of 101,200 tons, or about 72 per cent of capacity. The 40,000,000-ton rate requires a continuous average daily output over the four years of 109,600 tons, or over 4500 tons more per day than can be expected of existing equipment, with transportation, labor and fuel problems presenting no difficulties and every factor contributing toward maximum production.

Booklet of Iron and Steel Extras

The Steel Producers Export Corporation, 120 Broadway, New York, has published a pocket-size booklet of standard extras on iron and steel products which is being distributed. The booklet is of value because of the fact that it combines within one cover all of the lists of extras issued by manufacturers in many different iron and steel lines. In general, the booklet is similar to that issued by the American Iron and Steel Institute during the war, but it is more complete, as it contains many specialties in addition to the major iron and steel products. There is an addendum of useful information, such as comparison of gages, thickness and weight of sheet iron and steel, weights of round and square iron per lineal foot, standard weights and gages of tin plates, etc.

Decreased Demand for Tin Plate

SEATTLE, Feb. 21.—The outlook for the sale of sheet tin plate is poor, owing to the disastrous season in the salmon canning industry in Alaska. Jobbers who sold 3500 boxes of tin plate last season say this season they will be fortunate if they sell 100 boxes. By this time each season cannery ships are being outfitted with plates, gear, nets and machinery and tools required for sailing into the cannery fields. There has been no activity whatever, jobbers reporting only one outfit sold, that to Libby, McNeil & Libby. The cannery business is one of the chief sources of revenue to metal jobbers here.

Time study and motion study as fundamental factors in planning and control are to be discussed by Dr. Frank B. Gilbreth, consulting engineer, Montclair, N. J., before the Baltimore section of the American Society of Mechanical Engineers at the Engineers' Club of Baltimore, March 22.

Machine Tool Builders Meet in Cleveland

Recommendations in the Matter of Uniform Cost Accounting—Activities of Association Formulated —Waiting Attitude in Respect to New Business

THE predominating feature of the meeting of the National Machine Tool Builders' Association in Cleveland last week was the presentation and discussion of a uniform cost accounting plan. The plan that was outlined in a lengthy preliminary report was approved by the members after the various sections had been thoroughly discussed, this taking virtually the entire first day of the meeting. Other plans were presented, having in view an enlargement of the constructive activities of the association, and as a whole the meeting was devoted to educational work.

The convention was held at the Hotel Cleveland, Feb. 24, 25 and 26, and was one of the best attended meetings ever conducted by the association. The number of members registering was about 165. August H. Tuechter, Cincinnati, president of the association, presided.

Atlantic City Meeting to be Held

Although it had been announced that the Cleveland meeting was to take the place of the May meeting in Atlantic City, it was decided by the president and executive committee that the semi-annual convention in May should be held as originally planned. This is scheduled for May 19 and 20.

The question of machine tool prices was not brought up at the general meeting, the sessions of which were executive, but the market tendencies were discussed at a number of committee meetings. These discussions were for the most part the interchange of personal views regarding present conditions and the outlook. Sentiment apparently was divided among those who have not already reduced prices, but at least some of the machine tool manufacturers seem determined to make no price reductions in the near future.

The preliminary report on the uniform cost of accounting plan was presented by C. H. Scovell, Scovell, Wellington & Co., accountants and industrial engineers. This subject was taken up at the special meeting of the executive committee held in December, and during the following months regional meetings were held in Chicago, Cincinnati, Cleveland, Worcester and New York. In addition many members filled out and returned questionnaires which had been prepared to bring out some of the underlying facts in respect to cost accounting in the machine tool industry. The report was approved by the executive committee before being submitted to the members.

The report recommended the use of a job order cost system that will show the cost of the jobs that are issued to the shops, including material, direct labor and overhead. It was found that the machine tool builders were already handling material and labor in a reasonably satisfactory way, so it was stated a discussion of better or more uniform methods of accounting would be concerned almost entirely with the distribution of overhead. A chart was presented showing the approved plan of collecting costs, particularly overhead. In this chart it was the aim to allocate to each department or operating center all the charges which belong there and which should be absorbed in the normal work done in that department. One feature of this overhead distribution is the plan for adding some of the overhead on to the material as it goes into work in process. A somewhat similar charge is added on the cost of finished stock, storage and shipping. The overhead charge is only on material used, no increase being made to the value of unused inventories.

Interest on Investment as Cost Factor

The executive committee unanimously recommended that interest on investment be included in calculating the cost of manufacture. It was stated that were this not done the overhead of different departments on different machines would not be correctly stated, and particularly that large expensive tools would otherwise have an insufficient overhead rate, as there would be nothing to measure the cost of tying up capital in such equipment as compared with light and comparatively inexpensive machines.

The interest on investment would be reckoned on all assets, including land, buildings, equipment and inventories. The immediate effect is to increase the overhead on work done with large expensive machines in comparison with that done with a smaller capital investment. It was pointed out that it is only when interest on investment is computed in the assets that are utilized in the business that correct costs can be figured on patterns made in the company's shop, in comparison with patterns bought outside, or castings produced in the company's foundry, in comparison with castings purchased. A similar situation arises in respect to an auxiliary department like a power house, and by following the plan a company can determine whether it is cheaper to operate its own power plant or buy power.

Make Up of Normal Overhead

The normal overhead is made up of the land and buildings factor distributed to the several departments on the basis of area occupied, equipment factor apportioned according to value of equipment used, steam and power distributed pro rata, general burden distributed in proportion to the number of employees, and repairs, supplies and indirect labor charged to the several departments as actually incurred.

A plan of distributing the overhead to departments was presented that is intended particularly for the larger shops. For the small shops the plan is to develop all the overhead that exists and add it to the cost of production. It was pointed out that in a very small shop, particularly a shop making one product, there would be no serious inaccuracy in having one rate for the whole shop, or possibly two or three rates, but if there were varied working conditions or a great variety of products, distinctions must be made to get accurate costs.

The report stated that a correct overhead rate in any department will be obtained by dividing the overhead of the department by the normal number of operating units, that is, the normal man-hours or machine-hours of the department. Care should be taken to see that the calculations of an overhead rate is made on the basis of operating units that can be realized with good management, but not considering a night shift or overtime period. In determining the per cent of theoretical hours to be taken as the standard in setting burden rates, allowance should be made for shut-downs of a department for tool repairs, absent workmen, etc., but this particular calculation should make no allowance for shut-downs resulting from lack of orders.

No Allowance for Shut-Downs in Overhead Rate

All the work done in a shop should uniformly carry the normal rate of overhead, not more when the shop is partly idle or less when it is unusually busy. This arrangement gives costs that are comparable at all times, varying only in proportion to operating efficiency. This plan of having a normal rate of overhead, the report stated, is particularly important in an industry subject to such ups and downs of production as the manufacture of machine tools. According to this plan, when his shop is busy all of this overhead will be earned and will be carried into work in progress. When the shop is operating on part time

a corresponding portion of the overhead will be unearned or unabsorbed and will go into loss and gain.

Taking up the kind of rates to use, the report stated that a rate-per cent-on-wage-cost as a method of distributing overhead is acceptable only when wages of all the operatives and the facilities are very uniform. As these conditions are rarely present in a machine shop, this method of distributing overhead is not satisfactory. The use of the man-hour rate removes the inequalities that arise by reason of the varying earnings of employees and recognizes the fact that overhead corresponds more nearly to the number of employees than it does to the wages they earn. Under some conditions the man-hour rate is a satisfactory method of distributing shop overhead, but generally the facilities with which the men work will vary so greatly that thoroughly accurate costs cannot be secured without the use of a machine-hour rate, which will be greater or less for different machines, according to their size, value, and the power they use. The method of fixing a burden rate and a plan of reckoning an earned and unearned burden was explained.

The report contended that a comparison of the actual hours with standard hours may be made an important factor in securing an economical administration. Shops with best management have daily operating reports summarized at frequent intervals accounting for all idle time of their machines. In order to fix the standard hours and to reduce to a minimum the loss resulting from idleness, this record needs consistent executive attention.

In analyzing a monthly statement form attention was called to the need of showing the gross gain, as the margin of gross gain must be secured before there is any profit, and it is especially important to a machine tool builder who is making two or more lines of product, for he should see clearly the margin of gross profit on each line separately. If members are engaged in other lines of business besides making machine tools, a separate statement of gross profits should be prepared for each line. The same plan should be applied to the operation of a machine shop or foundry. If a foundry is operated, the castings should be charged to the machine shop at a fair price, so that the company will know whether it is losing or making on the foundry.

Charging for Spoiled Work and Repairs

The report stated that there was considerable difference of opinion at the regional conferences as to how spoiled work should be treated. There are two plans for spoiled work, one is to let it stand as a part of the job and let all good pieces absorb the cost, and the other plan is to subtract all material, labor and overhead cost on the spoiled pieces from the cost of the job and charge this total, less salvage, to overhead. The first plan would properly be followed in a drop forge or custom stamping plant where the pieces are individual and might have such peculiarities of design as would make more spoiled work in some cases than in others, but it was contended that in an industry where spoiled work is not a factor of design but merely reflects careless workmanship or other errors, it is better to adopt the second plan and set up the net cost of spoiled work as an overhead factor where it occurs.

It was recommended that everything in the nature of repairs should be charged as an expense, that the cost of new drawings, patterns and jigs and fixtures, not replacement, should be separated from all other costs, and that these outlays should preferably be charged as expense in the year in which they occur, but under no circumstances should the expense be spread over a longer period than three years.

The Matter of Miscellaneous Shop Supplies

Miscellaneous shop expenses, such as oil, waste, emery wheels, hardening compounds, hack saws, small drills, etc., should be treated as supplies and charged to expense as issued. Perishable small tools, such as hammers, screw drivers, reamers, larger drills, taps and dies, milling cutters, etc., caused considerable discussion, but the report stated that it seemed to be the best practice to charge these items to expense as issued, the same as supplies. However, many companies carry an asset for items of this kind intended to represent in a conservative way their investments in these tools. Plans for inventorying perishable tools at regular intervals on a conservative basis, or a plan of depreciation at a high rate, are acceptable.

It was recommended that belting be handled the same as perishable tools, but that if treated as an asset and subject to depreciation, a rate of 25 per cent is recommended. More permanent tools, such as micrometers, calipers, gages, vises, arbors, electric drills, pneumatic hammers, etc., if set up as an asset should be written off over a period not to exceed three years. Supplies, and perishable and permanent tools, should be set up as an asset when purchased and so carried as long as in the storeroom, but charged out to expense or otherwise when issued. Repairs should be charged to expense as incurred. Charges for repair work should include both wages and overhead on the man-hour basis. It is only when repairs are calculated at the full cost in this way that the repair charges of the respective departments appear correctly.

Depreciation Factors

The report stated that the depreciation rates should take into account obsolescence, because an asset may not continue to serve its intended purpose until it is worn out, but may be outgrown by the size of the business, by the need of moving to a new location, or by being superseded by a design as more efficient. The minimum rates recommended by the executive committee for a depreciation calculated on first cost were as follows: Concrete buildings, 2½ per cent; mill type buildings, 4 per cent; wooden buildings, 6 per cent; machine tools, motors, traveling cranes and miscellaneous power house electrical, plumbing, lighting, heating and ventilating equipment, 10 per cent; transmission, 15 per cent; heavy motor trucks, 20 per cent, light trucks, 30 per cent; shop furniture, bins, racks, etc., 25 per cent.

Included in the report were loss and gain statements, balance sheets and various details, these emphasizing the importance of having cost accounting tied up with the general bookkeeping.

Another subject discussed was that of the factors to be considered in fixing the selling price. An estimate sheet was presented to show what charges should be added to the manufacturing costs to make a fair selling price. It was pointed out that if only normal burden is charged in costs there will be at all times considerable increased burden that develops during long dull periods, which should be reflected in the selling price.

View of Machine Tool Builders

F. A. Geier, Cincinnati Milling Machine Co., gave a talk on the financing of the machine tool business, looking at the subject from the investors' point of view. He said that during the ten years prior to 1913, 70 per cent of the strongest machine tool builders showed earnings of only 9 per cent on invested capital. Some did better during the war, but his estimates were that their earnings on invested capital since 1913 had been only 10½ per cent.

J. B. Doan, American Tool Works Co., Cincinnati, discussed the general business situation. He saw no prospect of an immediate revival of the machine tool business and said that all the machine tool builders could do was to wait for business to come back. He urged builders to get costs down and to write off inventories and that plants that were over-extended should deflate themselves.

E. J. Kearney, Kearney & Trecker Co., Milwaukee, first vice-president of the association, presented a form of budget applicable to the machine tool builders. He also discussed the subject of how to run a machine shop in a time of depression, speaking particularly along the line of financing. He urged careful financing and that no attempts should be made to force a market when there is no market.

Survey of Industry Proposed

Earnest F. DuBrul, general manager of the association, presented and explained an activities chart for

machine tool builders, which was discussed at some length. This included three main subdivisions, technical, financial and marketing. Under the technical heading he included plant, manufacturing equipment, design, research, standards, production management, stores, labor and other items. Under financial, he included legislation, credit, accounting, insurance, welfare and general education. Subdivisions under marketing included ethical customs, standards, foreign and domestic markets, sales channels, sales methods, advertising, service, etc. Mr. DuBrul also stated that the association planned to make a survey of the machine tool industry as far back as it is possible to go.

During the session Saturday morning an interesting talk on conditions in Europe was given by H. B. Kraut, of Joseph T. Ryerson & Son, Chicago. He had just returned from a trip that included most of the European countries, and told of the conditions as he found them abroad from a financial and industrial standpoint, and particularly in respect to the outlook in Europe for the machine tool industry. Generally, he found that conditions had commenced to improve abroad.

Tributes to Messrs. Hildreth and Merryweather

During the first day of the session a fine silver service was presented to Charles L. Hildreth, who retired Jan. 1 as general manager of the association. This gift was in appreciation of Mr. Hildreth's long service with the association, of which he was secretary before he became general manager. The presentation speech was made by W. A. Viall, Brown & Sharpe Mfg. Co.

A testimonial dinner, attended by a large number of the machine tool manufacturers, was given for George E. Merryweather, president of the Motch & Merryweather Machinery Co., Cleveland, in the banquet room of the Hotel Cleveland, Thursday evening, to show appreciation of the efficient services rendered by Mr. Merryweather during the war, both in behalf of the Government and in behalf of the machinery manufacturers, while serving as chief of the machine tool section of the finished products division of the War Industries Board.

J. B. Doan, president of the American Tool Works Co., Cincinnati, was toastmaster at the dinner, and eulogistic remarks referring to Mr. Merryweather's work during the war-time period were made by August H. Tuechter, president of the National Machine Tool Builders' Association; Fred A. Geier, Cincinnati Milling Machine Co., and others. As a further token of appreciation of Mr. Merryweather's services he was presented with several pieces of furniture for furnishing a den in his home.

Steel-Making Economies Receive Attention

Electrical Engineers at Chicago Discuss Various Steel Processes —Electric Furnace and General Subject of Fuel Cost Considered

THE relative merits of various processes of making steel, the possibilities of further economies in each, and the future of the electric furnace in the industry were discussed at the monthly meeting of the Chicago section of the Association of Iron and Steel Electrical Engineers, at Chicago, on Feb. 19, as briefly reported in THE IRON AGE of Feb. 24. The history of the Bessemer process was recounted by John Sullivan, assistant superintendent Bessemer plant, Wisconsin Steel Works, South Chicago. He pointed out that, although this country owes its present industrial supremacy to the invention of the Bessemer process, the converter was at one time nearly abandoned because of the "cold shortness" and "red shortness" of the metal produced. Red shortness was finally eliminated by the addition of manganese to the bath, while cold shortness was found to be the result of high phosphorus content in the ore. Thus far the only method which has been discovered to prevent cold shortness in the acid Bessemer process is to use low phosphorus ore. This has proved a limiting factor on the use of the converter, notwithstanding the fact that from the standpoint of time and cost of reducing ore it is superior to the open-hearth furnace. An important advantage of the converter is that it is operated without fuel.

Comparison of Three Processes

In discussing Mr. Sullivan's paper, F. von Schlegell, president Industrial Electric Furnace Co., compared the Bessemer, open-hearth and electric processes of making steel and indicated the advantages and disadvantages of each. The principal criticism of the converter lies in the iron loss incurred and the higher grade of ore and coke necessary in the process. On the other hand, fewer heats can be secured from the open-hearth furnace and fuel and other costs count against the process. It is through the use of considerable quantities of cheap scrap and through less metal loss that the open-hearth is able to compete in cost with the converter. A combination of the Bessemer and open-hearth is used to take care of changes in the pig iron and scrap markets, and also for refining the output of the converter in the open-hearth furnace.

In an elementary sense the electric furnace is similar to the open-hearth in that the metal is in a dish-shaped vessel with the heating medium above it, and in steel plants, where hot metal from the blast furnace is available, there is an opportunity for the electric furnace as a substitute for the open-hearth in the duplex process. It is in steel plants not served by blast furnaces that the electric furnace is rapidly finding a place as a substitute for both the converter and the open-hearth furnace.

Costs of Making Steel Compared

The costs of the different processes depend to a considerable extent on market prices for scrap, pig iron and fuel, but comparisons made by Mr. von Schlegell on the basis of December costs are, nevertheless, of much interest. The figures were computed to cover the cost of making about 5000 tons of soft steel per month by the three cheapest probable processes: First, the basic open-hearth using basic pig iron and scrap; second, the cupola, converter and electric process; third, the straight electrical process, or one in which cheaper grades of scrap steel would be heated to cherry red in a fuel-fired furnace and then dropped into the electric furnace for melting and refining. This comparisbn was based partly on actual results in a specific plant in the Middle West, and, for the rest, on actual figures reduced to the same tonnage basis.

The open-hearth plant would use, for example, a 60-ton open-hearth furnace, melting 1500 tons of basic pig iron, costing $48,750; 900 tons of iron scrap, costing $14,300; 3100 tons of steel scrap, $57,650; ore and cinder, $1,400; ferroalloys, $4,500, or a total of $126,600 worth of charge for 5000 tons of steel produced, giving a cost per ton of $25.30. To this cost must be added fuel oil, labor, maintenance and general expense amounting to $13 additional, bringing the total cost per ton to $38.30.

To produce the same quantity of steel, using the cupola, converter and electric furnace, would have required the purchase of 6000 tons of charge (practically all iron and steel scrap) to allow 5 per cent for cupola loss, 12 per cent for blowing loss and 1 per cent for refining loss. The cost per ton of the metal in the ladle was figured at $20; the lime, coke and power in cupola, $1.70 per ton; electrodes, electricity, lime, ore and fluorspar for electric furnace, $5.40; supplies for cupola, converter and electric furnace, 60 cents; labor, $1.50; general expense, $3.10; making a total cost of $32.30 per ton of steel produced.

Using a cheap grade of steel scrap, preheating in

fuel-fired furnace and refining in an electric furnace, the following costs were obtained: Cost of scrap per ton of metal in ladle, $16.50; preheating scrap, $1.70; electric melting, including electricity, electrodes, lime, ore, etc., $9.10; miscellaneous supplies, 50 cents; labor, $1.50; general expense, $3.10; making a total of $32.40 per ton, or approximately the same as in the cupola, converter and electric process, and six dollars less than in the open-hearth process. Electricity was computed at 1½c. per kwh. in figuring the above costs.

Direct Process Not Near

The direct manufacture of steel from ore is a remote possibility in this country on account of the cost per kilowatt of hydro-electric developments, said Mr. von Schlegell. Some two-stage process may be developed, however, in which an iron sponge will be produced by deoxidizing the ore by fuel, and subsequently melting the sponge like scrap in the electric furnace.

In speaking on the subject of steel-making costs, E. S. Jeffries, electrical engineer Steel Co. of Canada, and national president Iron and Steel Electrical Engineers, called attention to what had been accomplished with the McKune open-hearth process. Ordinarily, it requires 8,000,000 B.t.u. of heat to produce a ton of steel in an open-hearth furnace. In the McKune process the gas is burned at the ports, so that melting is accomplished in the bath by heat rather than by direct flame contact. With a McKune type open-hearth, he said, the heat economy was fully 50 per cent, the consumption per ton of steel averaging 4,000,000 B.t.u. The McKune type furnace will likewise yield 700 heats before relining is necessary, whereas the average for ordinary type furnaces is 300 heats.

Addressing himself to the subject of heat economy, Gordon Fox, electrical engineer Freyn, Brassert & Co., and chairman Chicago section Iron and Steel Electrical Engineers, cited a recent test at the Homestead Works of the United States Steel Corporation, in which it was found that the steel tapped contained only 14 per cent of the heat input, while the slag contained 3.3 per cent, the chemical reactions 2.8 per cent, 22 per cent was absorbed in the checkers, 35 per cent was lost in the stack, 17 per cent was accounted for by radiation from the furnace, and about 6 per cent was lost through the ports.

That the thermal efficiency of the fuel burned is even less in a ton of rolled steel was pointed out by H. J. Freyn, Freyn, Brassert & Co. Ordinarily, he stated, citing A. Dykerhoff, a ton of rolled steel contains no more than from 2.25 to 11 per cent of the heat consumed in the process of making it. The opportunities in the field of fuel economy in the iron and steel industry are very great, he said. A recent development, which promises to mean much from the standpoint of fuel costs, is the new type of by-product coke oven recently put into operation by the St. Louis Coke & Chemical Co. at Granite City, Ill. When the ovens were started the proportion of the coals used was 15 per cent Pocahontas, 42½ per cent Indiana, and 42½ per cent Illinois coal. The proportion of Pocahontas has since been reduced to 10 per cent and, according to present plans, will be entirely eliminated later.

The next meeting of the Chicago section of the electrical engineers will be held on March 22. The principal speaker will be J. D. Wright, electrical engineer, power and mining department, General Electric Co., whose subject will be "Control Equipment for Auxiliary Motors."

Increasing Activity of Michigan Plants

DETROIT, March 1.—The ever-increasing number of plant reopenings in Michigan and the number of definite announcements as to dates of reopenings indicate the improvement in the general industrial situation.

Within the last 10 days the Ford Motor Co. has added about 2000 men to each shift in the Highland Park plant and 300 at the tractor factory in River Rouge.

The C. R. Wilson Body Co., Detroit, took on 200 men at the beginning of the last week.

The Federal Motor Truck Co., Detroit, will start production again March 1, with a schedule of 200 vehicles a month, as against a normal production of 450.

The plant of the Hayes Wheel Co., St. Johns, Mich., will reopen March 1, with a full working force.

Three of the Fisher Body Co. plants in Detroit have resumed operations on reduced schedules.

The American Motor Body Co., Detroit, formerly the Wadsworth Mfg. Co., has put 600 men at work building sedan bodies for the Ford Motor Co.

The Muskegon Motor Specialties Co., Muskegon, Mich., is running one-third the regular force on a six-day week.

The Nichols & Shepard Threshing Machine Co., the American Steam Pump Co. and the Duplex Printing Press Co., Battle Creek, Mich., are again keeping their regular working forces busy, while the Duplex company has increased its working force. The A. B. Stove Co., Battle Creek, has reopened its foundry.

The Melling Forge Co., Lansing, Mich., has resumed production on a reduced schedule.

Refused to Indorse Report

BUFFALO, March 1.—Members of the council of cities of the Methodist Episcopal Church, meeting in Buffalo, refrained from endorsing the report of the Interchurch World Movement on the steel strike of 1919. A motion to endorse the report precipitated trouble on the convention floor. The motion, in the form of a report, signed by Bishop Francis McConnell, of Pittsburgh, contained severe criticism of officials of the steel industry. Some of the conservative delegates insisted the council members were not sufficiently informed in the matter to pass judgment, while others, led by the Rev. W. S. Mitchell, of Philadelphia, insisted it was the duty of the council to take a definite stand. No mention was made of the open-shop end of the controversy. When the report was finally presented for adoption it was considerably changed from the original. It reads as follows:

First. After conscientious reading of the report of the Interchurch World Movement commission of inquiry into the steel strike of 1919, we record our appreciation of the work done by the commission.

Second. Because adequate knowledge is essential to correct judgment concerning great moral issues, we assert the right and consequent duty of the church to acquaint itself with any industrial or social situation where moral issues are at stake in which labor or capital, either separately or together, are involved.

Third. We assert the more fundamental right and duty of the Christian church to preach and to teach those ideals of social and industrial justice which will prevent the misunderstandings and strife now so characteristic of our human relations.

Quick Shipment to Pacific Coast

Scheduled fast freight service between the Mahoning and Shenango Valleys and the Atlantic seaboard, inaugurated by the principal trunk-line carriers,, has enabled the movement of pig iron via the Panama Canal to the Pacific Coast at not only lower transportation charges, but with quicker dispatch. A recent shipment of iron from a Mahoning Valley furnace was delivered on board steamer at Baltimore 48 hours after leaving the furnace yard and is now en route to a steel works on the Pacific Coast. This trial order will be followed by others. Because of recent high pig iron prices a number of open-hearth interests on the Western Coast have been using larger quantities of scrap metal than is usually the practice, and have been buying much of the pig iron used from Great Britain.

The Keokuk Electro Metals Co., Keokuk, Iowa, is now producing all grades of silvery iron as well as all grades of Bessemer ferrosilicon. The heavy demand for 50 per cent ferrosilicon during the war resulted in expansion of the company's plant, and the increased capacity has been devoted to silvery iron and Bessemer ferrosilicon production.

Setting a Task for the Salesman

Taylor Society Discusses Quota System for Laying Out Work of Sales Department—Results Accomplished by This Method

SETTING a task for the sales department and for the salesman was the keynote of the winter meeting of the Taylor Society at Springfield, Mass., Feb. 24, 25 and 26. One of the four committees—the committee on sales quotas—of the Sales Management Section of the society presented its preliminary report. This, together with its discussion, occupied the entire day on Feb. 25.

The report, which was presented by Charles P. Staubach, Burroughs Adding Machine Co., covered the subjects of: Nature and purpose of quota; quota of the sales department, or master task; distribution of the quota—territory units, salesman's quota, customer's quota; data for determination of quota; securing the data; results of quota system.

What the Sales Quota Is

A sales quota is a predetermined amount of business to be obtained in a given period by the sales department as a whole, by any branch of the sales department, by any individual salesman, in the entire country or in any state, county, city, sales district or subdivision of these. It may also be extended to include the predetermined amount of business which should be secured in each line handled by the sales department and the amount that should be obtained from different industries or businesses served by the company.

The predetermination of a quota, and the subsequent comparison with it of the records of sales, shows many things to the manager of the business. It indicates the most efficient salesmen, the lines of product that need more intensive effort, territory that has not been properly worked, and the lines along which the most profitable results will be obtained.

The quota will often show that the salesman who returns the largest amount of business, either in dollars or in number of sales, is not necessarily the most efficient. He may be working an exceedingly rich territory, larger than he should have, and devoting his attention to an easily sold but less profitable item, and neglecting others which are more difficult to sell, but which yield a greater net return to the company. The quota will also frequently show that the territory is unequally assigned, and that one salesman or agency has a large area, with comparatively few prospects, while another has a small territory, but more prospects than he can properly cover. The determination of quotas will then automatically call for a rearrangement of territory.

Indicating the Good Salesmen

In regard to the efficiency of salesmen, it was pointed out that the statement of gross business obtained was not a good index of the relative eficiency of the men. For instance, two salesmen, Smith and Brown, returned sales of 220 points each. However, Smith's quota was 220 points while Brown's was but 180 points. Smith's score, on a percentage basis, then was 100, while Brown's score was 122.2. Evidently Brown had proved the more valuable man to his company, assuming the quotas correctly assigned.

It was pointed out that the quota enabled the manager to check up on the salesmen, and to determine whether or not they were neglecting some lines and giving excessive attention to others. Thus, if the company was manufacturing and selling two well-established products, A and B, for which there was a good demand, and introducing a third product, C, for which the demand had yet to be established, Brown's quota of 180 points might be made up and his sales exhibited somewhat as follows:

	Quota	Sales
Product A	60 points	60 points
Product B	80 points	110 points
Product C	40 points	50 points
Total	180 points	220 points

It is thus evident that Brown is not neglecting any one of his lines, and that he is putting in more than the average effort required to introduce the new line.

On the other hand Smith's quota, in a richer territory, and his sales, may appear as below:

	Quota	Sales
Product A	70 points	60 points
Product B	100 points	130 points
Product C	50 points	30 points
Total	220 points	220 points

With such a tabulation before him, the sales manager recognizes at once that although Smith has turned in the gross volume of business expected, he did it by concentrating on the easily sold and fast-moving product B, at the expense of the more difficult items A and C. The admonition of Smith, and the possible transfer of the more industrious Brown to the better territory of Smith, is immediately indicated.

Properly Covering Territory

In a similar manner, the committee's report showed how the application of the quota will indicate whether or not a salesman is working every portion of his territory, or whether he is concentrating his work in the section that will produce the greatest results with the minimum of effort. Bearing in mind the fact that the properly developed quota shows not only the amount of business to be expected in each division of a territory, but also the amount of business in each line in each division, we may assume that Smith's quota of 220 points is to be made by selling the following amount of each line in the several divisions of his territory.

	Division 1	Division 2	Division 3	Division 4	Total
Product A	20	30	10	10	70
Product B	25	50	15	10	100
Product C	15	20	10	5	50

The sales, when tabulated, might show the following results:

	Division 1	Division 2	Division 3	Division 4	Total
Product A	10	40	5	5	60
Product B	30	70	20	10	130
Product C	10	20	0	0	30

Such a tabulation indicates one of two things: Either Smith is spending most of his time in Divisions 1 and 2, where the work is easy, or else the quota is in need of revision. In either case, the sales manager has definite data with which to work and from which to draw conclusions.

Determination of Quota

To be of real value to the sales manager, however, the quota should be accurately determined. A quota, accurate or inaccurate, is better than no quota, but the more accurate it is, the better tool it becomes for the direction of the sales department. Considerable attention was, therefore, given by the committee to methods of determining quota. The initial step is, of course, the determination of the quota of the sales department as a whole; that is, the amount of business that it is expected will be done in the ensuing year. This is usually expressed as a percentage of the previous year's business, and, furthermore, is usually set as something over 100 per cent. The quota to be set

is modified by many factors, such as the productive capacity of the factory, the raw material market, general business conditions, finances, etc. These factors must be examined with great care, and the heads of the several departments concerned should be consulted before the final figure is determined. The quota itself may be expressed in any convenient unit, as dollars of sales, number of items sold, or points. The latter is usually chosen, one point representing a certain number of dollars of sales.

The quota for the whole sales department having been fixed, it is then apportioned among the various sales divisions of the company by the application of a ratio made up of several factors. The Burroughs Adding Machine Co. makes up its ratio on the basis of population 50 per cent, and number of business enterprises, 50 per cent. To illustrate: Assume a quota of 1000 points, to be sold to a population of 250,000, in which there are 1000 business enterprises. The ratio then will be as follows:

Based on 1000 of population.....1000÷ 250×0.50=2.00
Based on business enterprises.....1000÷1000×0.50= .50

That is, for each 1000 of population in a district, the quota will be two points, and for each business enterprise, the quota will be one-half point. If the district above mentioned be divided into three divisions containing the following distributions of population and enterprises,

	District A	District B	District C
Population	100,000	75,000	75,000
No. of enterprises	400	350	250

the quotas, expressed in points, will be

	Population Quota	Enterprise Quota	Total Quota
District A	200	200	400
District B	150	175	325
District C	150	125	275

It was brought out that many other factors are in use in different companies in making up the ratio. Among these may be given, wealth, ability of salesmen, productive capacity of factory, district manager's estimates, percentage increase of sales, past performances, number of possible buyers (estimated), time required to cover territory, automobile registration (used by a tire company), product in use, etc. The value of some of these is exceedingly problematical, and some are worse than useless. One company reported that its quotas were made up on the basis of "what the salesmen thought they could produce." The selection of the factors to be used in making up the ratio should be a matter of the most careful consideration, as also should be the weight allotted to each factor.

Apportionment of the Quota

The quota for the company having been determined and divided according to major sales districts, it is then further broken down within each district. For this purpose, the county was held to be the most convenient unit. The county quota is determined by the method outlined above, and this quota is still further broken down to individual territories by the same method. An effort should be made so to subdivide the county as to give individual territories of approximately equal quotas.

In doing this, the cities and larger towns are first taken out, to be handled separately, and probably subdivided still further, and the township is made the basis of division. Sufficient adjoining townships are grouped together to give a territory having the requisite quota. Each division and subdivision is made by the method heretofore explained.

Where several products are handled by the sales force, a still further application of the above methods will serve to determine a quota for each product in each district. Thus, if three products, A, B and C are to be sold, and each has a market that partly overlaps that of the others, each product would be tabulated according to the enterprises it would reach. Such a tabulation might be

	Banks	Retail Stores	Garages	Printers	Manufacturers	Total
Product A	15	1500	0	0	75	1590
Product B	50	500	100	50	200	900
Product C	0	25	25	150	750	950

If the ratio for business enterprises is taken at one-half point, as before, and the ratio per 1000 of population at two points, the total population being, say, 200,000, the quota for each of the products in the district will be calculated as:

	Population Quota	Enterprise Quota	Total Quota
Product A	400	1590×0.5	1195
Product B	400	900×0.5	850
Product C	400	900×0.5	850

It was made quite plain that the method of calculating quotas by means of ratios was capable of great flexibility, and could be used to determine quotas down to the smallest subdivision of a sales department, even down to the individual customer. In the hands of the live sales manager it has proved to be one of the best means of increasing sales that has been developed.

Sources of Data

The sources of data for computing sales quotas are many. They include the records of the enterprise as to past performance, as regards classes and styles of goods and their relation to localities, census records of population, financial reference books, as Dun and Bradstreet, manuals covering public utilities, building and loan associations, etc. There are also concerns which will make a count and classification of enterprises. It was stated that a complete count of this character was made for $5000, and that by sharing the figures with four other enterprises, the expense to each firm was only $1000. Each sales manager must, of course, be the judge of the value of the several data available, and the expense to which it is wise to go to make it complete and accurate.

Results of Quota System

Probably the greatest results of the quota system are on the salesman himself, with a consequent effect on sales. Another result is the proper valuation of territory and the ease with which territories can be rearranged and adjusted. The ability to measure the performance of salesmen enables the manager to assign his men to the territory in which they will be most productive. Unquestionably the inefficient salesman will be promptly revealed, and compelled either to improve or eliminate himself. As a result, the labor turnover in the sales department may be high at first, but after reaching a peak will drop rapidly until it becomes stationary at a level below that which obtained prior to the adoption of the quota system. Statistics regarding turnover are to be included in the final report. It is significant that of all the concerns that have adopted the quota system, none is recorded as having gone back to its former plan.

Tank Orders from Distant Countries

Orders have been received by the Youngstown Boiler & Tank Co., Youngstown, Ohio, for its products from India, Australia, Japan, England, Spain, Hawaii and South America, besides a large domestic demand. The company manufactures tanks in capacities ranging from 400 gallons to 55,000 barrels, and has facilities for fabricating rectangular tanks, miscellaneous plate work, bins, stacks, kilns, standpipes, flumes and tank supports. On one day recently the company shipped tanks to Nankipur, India, and to Luke Field, Hawaii, the Hawaiian tanks being purchased by the United States Government.

One of its orders, recently completed, included a battery of eight open-top "slurry" tanks, built and erected as part of a unit of 26 tanks for the Bessemer Limestone & Cement Co., Bessemer, Pa. These tanks are of 125,000 gal. capacity each.

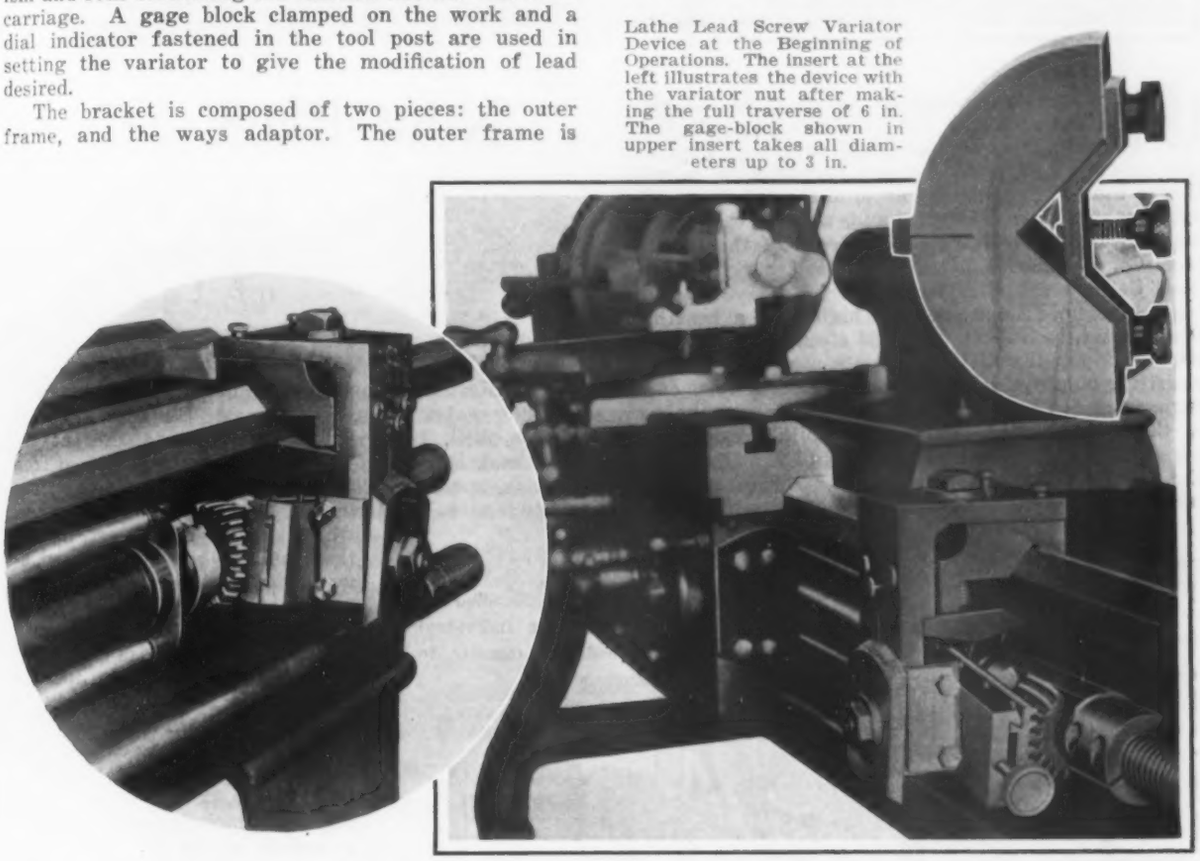
The company's plant is specially designed for the purpose of manufacturing tanks of large capacity. Powerful multiple-type machines are used to punch holes. All of the company's tanks are made to standard sizes, while heads of cylindrical tanks up to and including 10 ft. diameter are one piece. The flanging and dishing process is done without heat on a 200-ton machine to eliminate scaling. All rivets, which are uniform in size and thickness, are driven on hydraulic machines under 100 tons pressure.

Lathe Lead Screw Variator Device

For elongating or diminishing the normal lead on lathes and for the correction of any errors in the lead, the Precision & Thread Grinder Mfg. Co., South Twenty-first Street, Philadelphia, is marketing a new device known as the precision and thread lead screw variator. Its use is said to permit the doing of precision work on an ordinary lathe, the cutting of metric threads without requiring translating gears, facility in the manufacture of tools for the generating of gears and racks, obtaining any lead variation desired; and permits of elongating the lead to compensate for shrinkage in the manufacture of those parts that are to be subsequently hardened.

The device consists essentially of a bracket unit clamped to the ways of the lathe, a lead screw mechanism and rods connecting the variator nut with the lathe carriage. A gage block clamped on the work and a dial indicator fastened in the tool post are used in setting the variator to give the modification of lead desired.

The bracket is composed of two pieces: the outer frame, and the ways adaptor. The outer frame is adjustable horizontally sufficient to make the proper connection between the bracket and the mechanism carried on the lead screw. The bracket carries a swivel rack and provision is made for making vertical adjustment to bring the rack swivel center in line in the center of the lead screw. This adjustment can be locked and subsequent tilting of the rack does not disturb the vertical adjustment previously made. The rack is equipped with a graduated plate to show the degree of inclination.



Lathe Lead Screw Variator Device at the Beginning of Operations. The insert at the left illustrates the device with the variator nut after making the full traverse of 6 in. The gage-block shown in upper insert takes all diameters up to 3 in.

The lead screw mechanism consists of an adjustable nut with an extension carrying a half gear, which is free to swivel in line with the rack. The variation in the lead is obtained by this half gear revolving in accordance with the swivel of the rack as the nut is traversed in either direction by the action of the lead screw. The regular lead screw nut in the lathe carriage is not employed, the connection between the variator nut and the lathe carriage being made by two rods and a plate, as shown in illustration. Wear of the variator nut is minimized by its use only in moving the lathe carriage during the machining or grinding operation, the return of the carriage to its initial position being accomplished by a sliding nut, which is keyed in the variator nut frame to permit independent longitudinal movements in excess of possible variation of lead.

In order to set the variator to either precision normal lead or elongation of lead, a gage block is provided. It is clamped directly on the threaded work and is designed for all diameters up to 3 in. It is 1 in. wide, and is used in setting and testing the variation at one and the same time. The manner of setting is as follows: With the variator rack in horizontal position and a dial indicator fastened in the tool post of the lathe, the reading is taken on the right-hand side of the gage block. The indicator is then withdrawn, without removing, so as to clear the gage block, after which the lathe spindle is revolved as many times as there are threads to the inch, a scratch line on the gage block being used in gaging complete revolutions of the spindle. Then a reading is taken by the indicator against the right-hand side of the projection on the gage block, it having traveled 1 in. of the normal lead of the lathe screw lead. This dial indicator now gives the reading of the normal lead of the lathe. In cases where it is desired to get precision lead the rack is tilted up or down as the lead might be plus or minus, until the dial indicator gives the same reading as it did on the other end of the gage block in the beginning of the operation. In cases where it is desired to get elongation of the lead the rack is tilted up until the dial indicator reads to correspond with the amount of elongation desired. The rack is then locked and the device and lathe ready for the operation of machining or grinding. A record is made of the swivel graduation indexed with the rack in its position for future reference on the same kind of work.

This variator device is built in two models of similar design, but different size, one model being adjustable to fit lathes up to 12 in. swing, the other to fit lathes from 13 to 20 in. swing. A dust guard is provided to protect the lead screw from abrasive dust in grinding operations.

In the manufacture of thread gages and taps this device is said to be especially economical. The parts can be machined to close limits previous to hardening, thus reducing the time required in grinding and correcting lead distortion. It is also said to facilitate the manufacture of thread gages from cold-rolled steel, the process being to cut a sample of a bar of steel and test this sample for shrinkage in pack hardening. The remainder of that bar when used is then machined with the proper elongation in the lead to correspond with the shrinkage ascertained from the test pieces.

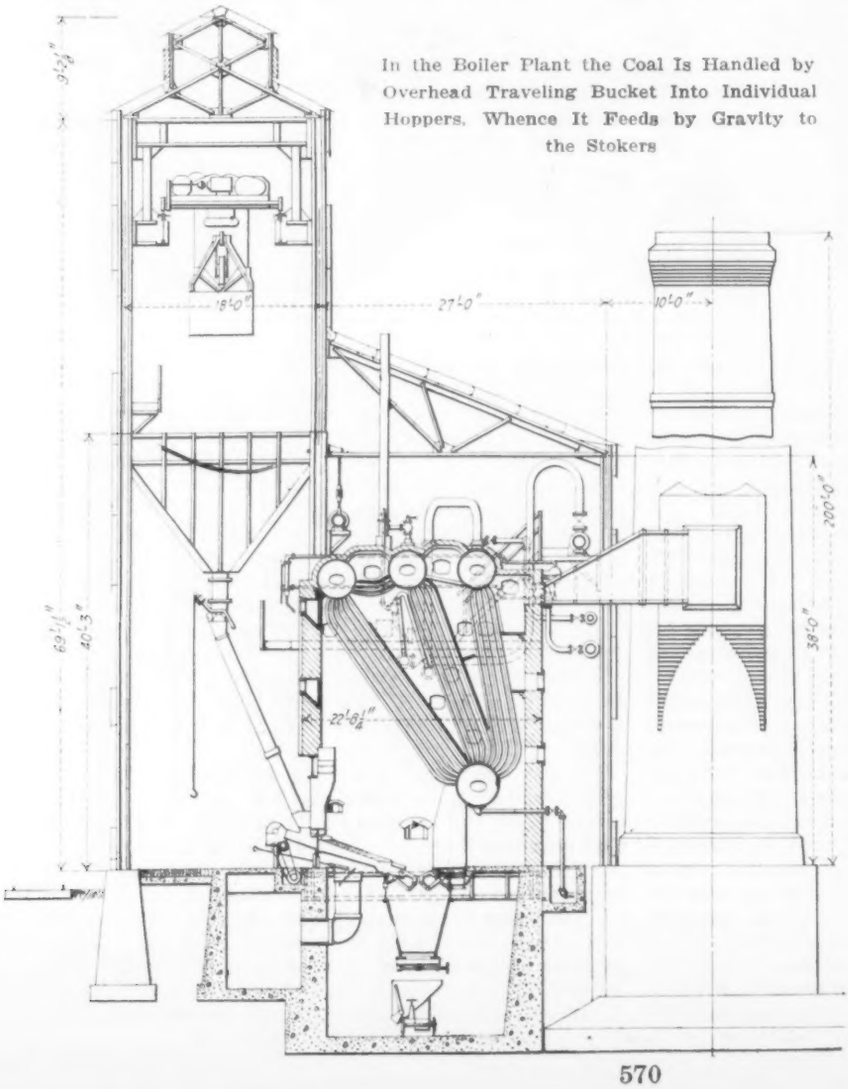
New Blast Furnace

Six Hundred-Ton Iron Making Capacity of the Pittsburgh

ONE of several important additions to the plant of the Pittsburgh Crucible Steel Co., Midland, Pa., is a new 600-ton blast furnace. This was only recently completed and will furnish iron, in addition to that of the older furnace, to the existing twelve open-hearth furnaces at Midland, and, as occasion demands, to several of the other plants of the Crucible Steel Co. of America, of which the Pittsburgh Crucible Steel Co. is a subsidiary.

The furnace stack is 92 ft. high with a hearth 18 ft. diameter, bosh 22 ft. 6 in. and stock line 16 ft. diameter. The top inwall is lined with cast steel plates to resist the abrasive action of the stock. The lines of the furnace and other principal dimensions may be seen in the sectional view shown in the illustration. The design of the furnace throughout is of heavy construction, especially the hearth jacket, which consists of cast steel segments 5 in. thick bolted together and reinforced by four 12 x 1½-in. rolled steel bands, while the cooling effect is obtained by the use of cast iron plates inclosing water pipes, placed inside the hearth jacket.

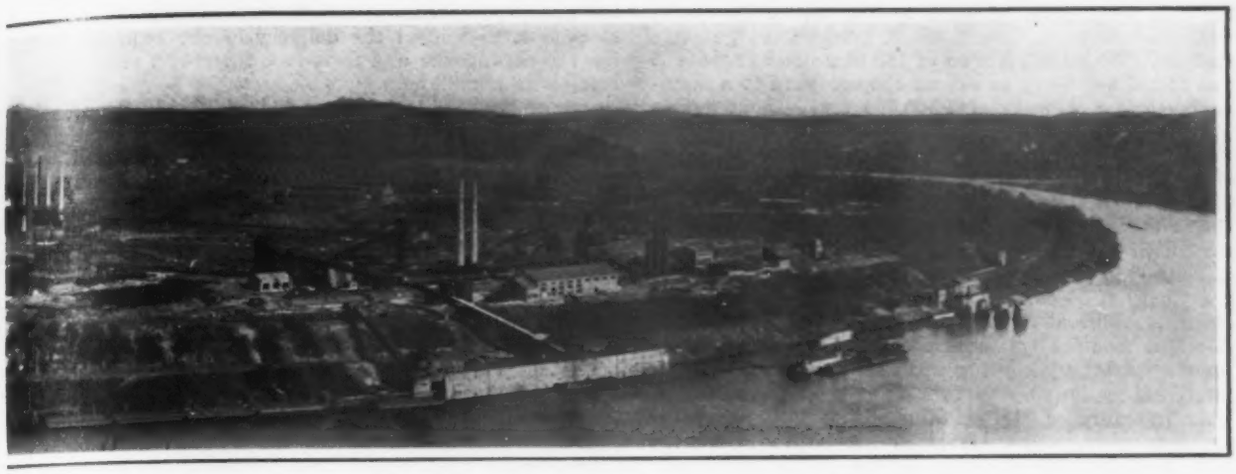
The shell, 1 in. thick and 32 ft. diameter at the lower end, is supported on eight massive inclined iron columns, spaced alternately 36 and 54 deg. apart, the larger spaces occurring at the two cinder notches, which are 180 deg. apart, and at the iron tap hole, which is midway between them and at 4 ft. 6 in. lower elevation. There are twelve tuyeres. The columns are spread out at the base on a 35½-ft. circle, resulting in an inclination greater than would ordinarily be required, to make provision for a possible future enlargement of the hearth diameter. The bustle pipe, 2 ft. 10 in. inside diameter, encircles the furnace at a radius of 20 ft. 9 in. The double skip incline bridge is supported on an independent structure, and in this manner relieves the furnace shell of any load from this source.



In the Boiler Plant the Coal Is Handled by Overhead Traveling Bucket Into Individual Hoppers, Whence It Feeds by Gravity to the Stokers

An electrically operated McKee automatic stock distributor is provided with separate control for 6 skip 4 station and 6 skip 6 station cycles. This control is located in the hoist house and is directly connected with the drum shaft of the skip hoist. Both large and small bells are operated by utilizing air from the cold blast main, while an independent auxiliary source of supply is obtained from a high-pressure air line in case of emergency due to lack of sufficient pressure in the cold blast main.

The hoist house is located just under the skip incline bridge between the furnace and the coke bins, and above the cinder car tracks. It contains an Otis electrically operated double skip hoist, with automatic control boards for the hoist and the McKee distributer, in addition to the cylinders



Recently Completed

Furnace Doubles Pig- at Midland Plant Crucible Steel Co.

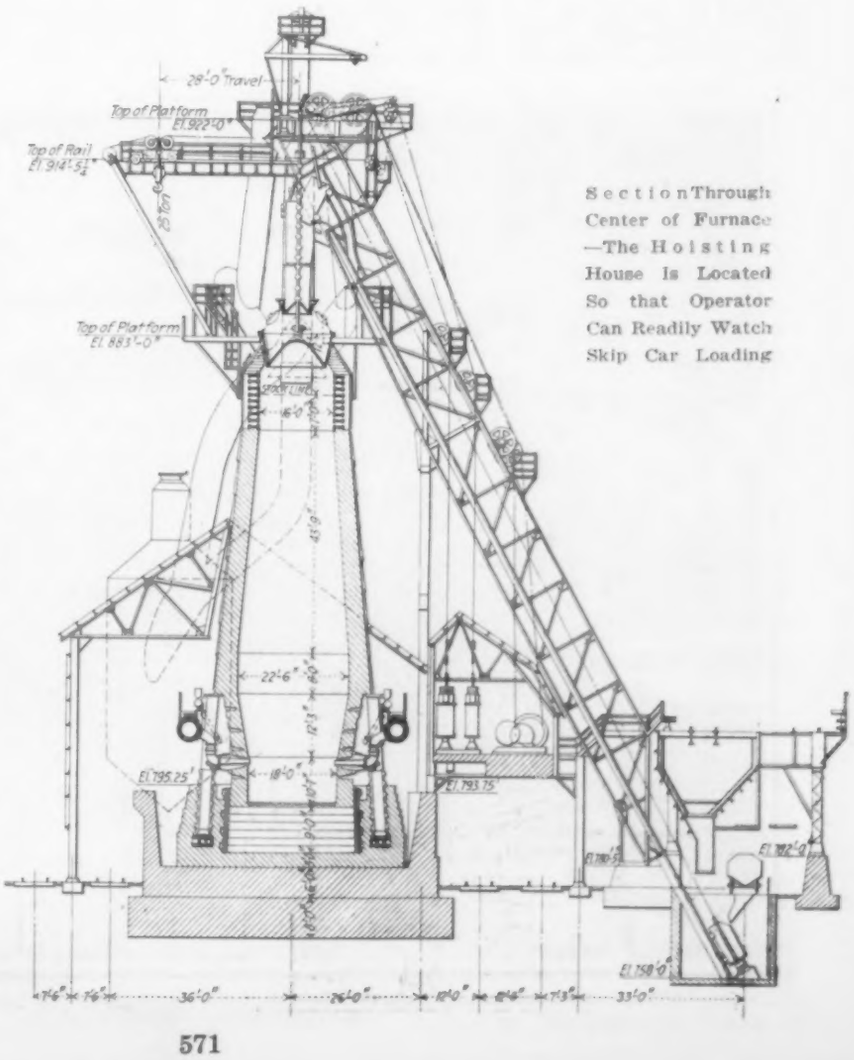
which operate the large and the small bell. Ample room is provided to store a spare armature for the hoist as well as other repair parts. The operation of the hoist, sounding rods and bell indicators is controlled by an operator on the level of the scale car floor of the stock bins, at a point convenient to observe the filling of the skip cars. For convenience in handling repair material on top of the furnace there are provided a 25-ton movable trolley and a 3-ton rotative jib crane. The cast house is equipped with a 15-ton electric overhead traveling crane.

Three 2-pass side combustion stoves are used, 23 ft. in diameter and 104 ft. high, each containing 98,550 sq. ft. of heating surface. The checker flues are 4¾ in. square; and the size of the brick 6 x 2½ x 12 in. The stoves are served by a single stack 7½ ft. in diameter and 200 ft. high. Each stove is furnished with one Berkholz-Terbeck burner and two revolving chimney valves, and the relief valve is connected directly to the underground flue common to stoves and stack. A combined passenger and freight elevator running to the top platform of the stoves, a distance of 92 ft. 6 in. above their base, is placed near the stack for the convenience of the workmen. This elevator, with platform 5 x 7 ft., has a capacity of 2500 lb. and is electrically operated at a speed of 100 ft. per minute. A stairway divided into short flights surrounds the elevator tower, and affords another means of access to the top platform.

A 9-unit Kling-Weidlein dry gas cleaner serves both blast furnaces, giving each four units and leaving one spare unit. The dust catcher is 25 ft. in diameter and 35 ft. high. Surplus gas from the stoves is utilized under the boilers. Kling-Weidlein goggle valves are placed at necessary points in the gas mains to afford a quick means of controlling the gas, and to sectionalize various parts of the gas system.

Stock from the yard is delivered to Hoover-Mason ore and coke bins, consisting of ten double stock pockets spaced 14 ft. on centers and one central coke bin located directly above the furnace skips. The bins are of heavy type steel construction with double louvers and 5 ft. diameter drums on each side. Two double compartment scale cars are used, equipped with bottom doors of manganese steel and capable of handling charges up to 30,000 lb. The cars are operated with 35-hp. railway type motors with standard drum controller and are furnished with indicating and recording apparatus. The usual method of operation for this type of bin has been adopted.

Raw material is received on cars by a Wellman-Seaver-Morgan movable car dumper electrically operated. The track on which the car dumper travels,



Section Through Center of Furnace —The Hoisting House Is Located So that Operator Can Readily Watch Skip Car Loading

1750 ft. long, runs parallel to the ore bridge yard, which covers a length of 2005 ft. between bridge cable anchors. With the erection of the new blast furnace it was found necessary to extend the ore yard to a maximum storage capacity of 1,300,000 tons—about double what it was formerly.

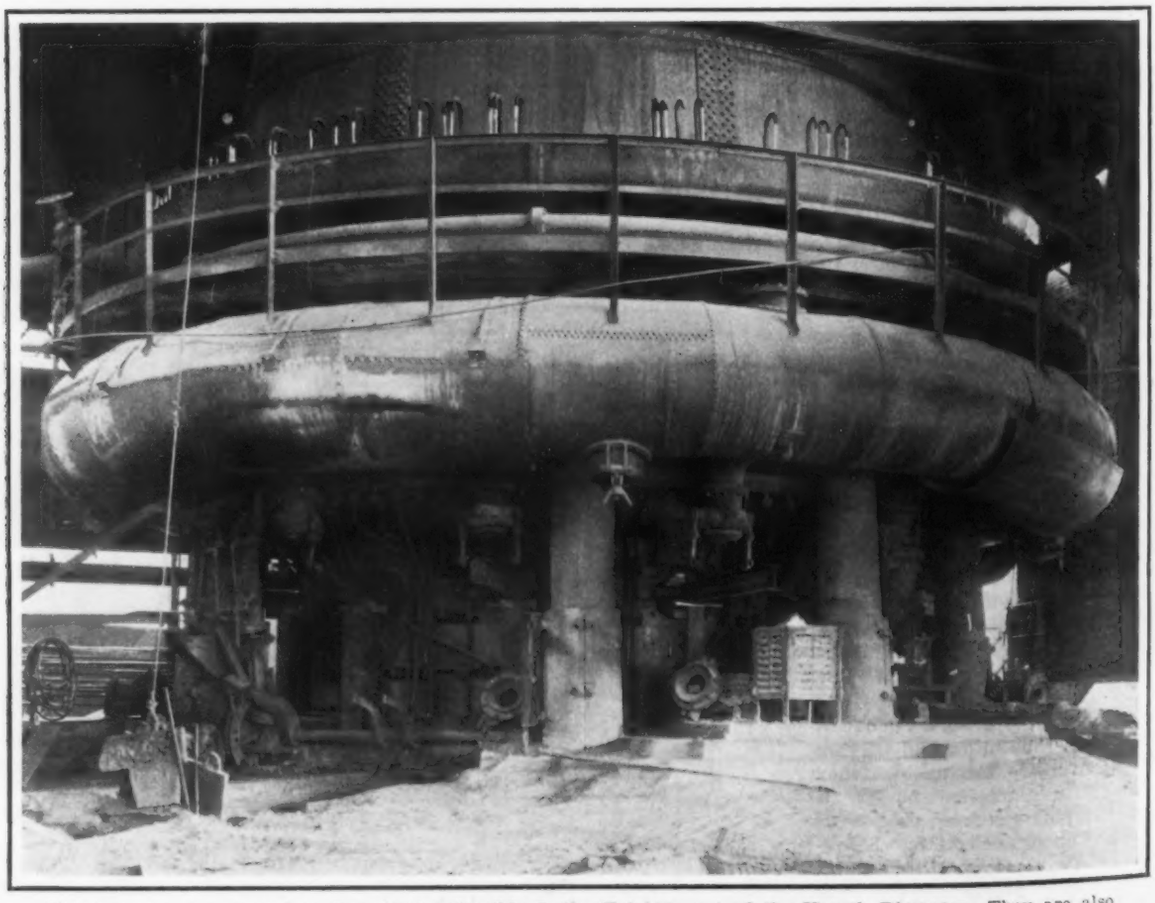
The car dumper is arranged for handling all types of open top railway cars in sizes ranging from 6 ft. 6 in. to 12 ft. high, width up to 11 ft. and an overall length up to 54 ft. This machine is designed to handle cars with a total weight, car and contents combined, of 280,000 lb.; dumping speed may be regulated to give a capacity of 30 cars an hour. The travel speed of the entire machine along the runway is 75 ft. per minute. A slight modification from the usual standard design for the machinery housing was necessary on account of interference due to the overhang of the ore bridge. This interference was eliminated by discarding the usual housing, which embraces the entire machinery floor, and covering only the motors and adjacent machinery with a small housing. The frame work of this machine was also modified to the extent of making the distance between end posts several feet greater than previous designs, in order to provide for the possible use in the future of longer cars than at present are employed.

From the car dumper the stock is unloaded into a receiving pit of concrete construction running parallel to the entire length of the runway, whence it is removed to the respective stock piles by two traveling bridges of Hoover-Mason design, one having a capacity of 15 tons and the other of 7½ tons. This reduces the travel of the ore bridges to a minimum, as the car dumper deposits the stock directly opposite the stock piles. Again in charging the bins at the furnace the bridge is placed over the pile of desired stock, and the bucket deposits its load into a 60-ton Hoover-Mason ore transfer side dump car, which travels on a steel trestle at an elevation of 32 ft. above the yard level, the tracks of which are an extension of those on the stock bins. The trestle track extends the full length, a distance of approximately 1165 ft., to the coke bins at the recently completed coke oven plant. The trestle is double tracked at each end, the shorter track next to the ore yard extending a sufficient distance from the stock bins to control the delivery of ore required for the second furnace and to reduce the travel of the ore bridges to a minimum.

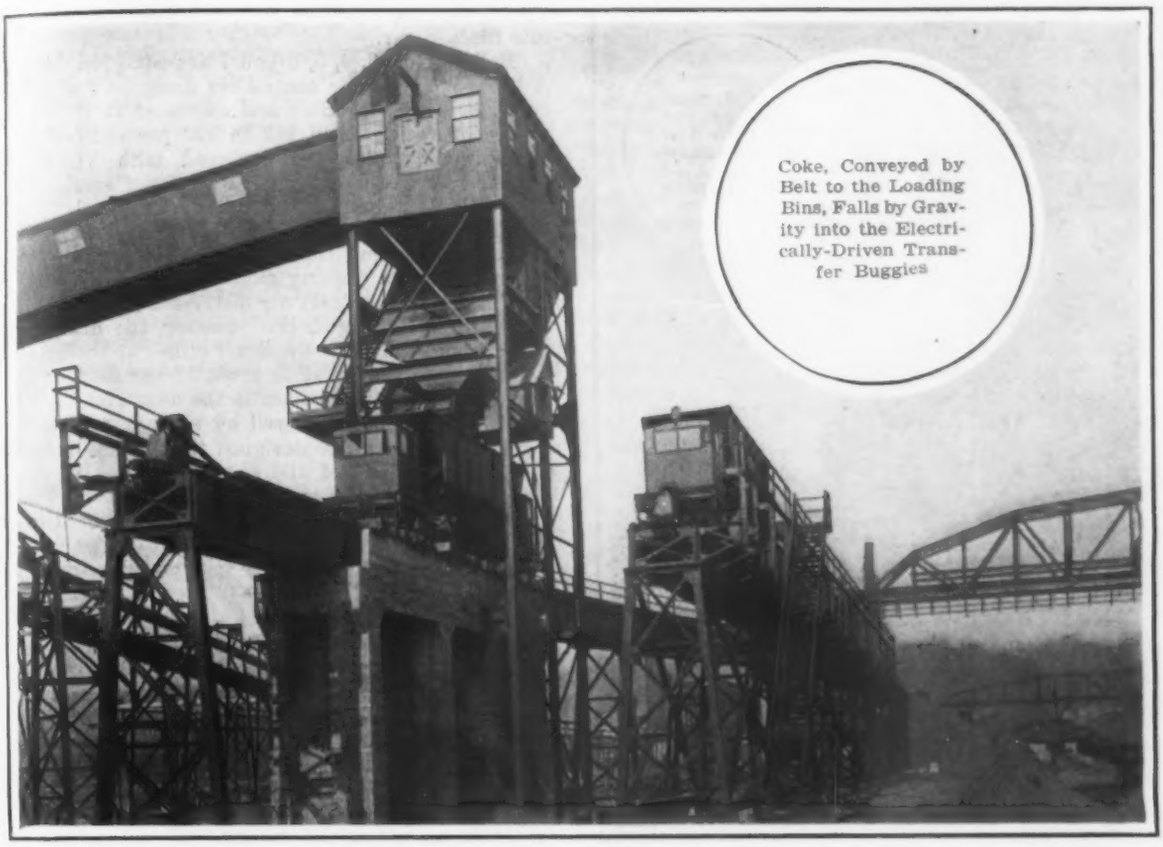
After the coke is delivered to its bin from the ovens it is conveyed to the central coke bin at the furnace by means of a one-side delivery coke car (manufactured by the Atlas Car Mfg. Co.) with a hopper capacity of 2100 cu. ft. and a weight capacity of 30 tons. This car is provided with two 50-hp. railway type motors, with a cab on each end for housing the operator and control equipment. The total weight of car and load is 80 tons.

The coke from the central bins enters the skip buckets through chutes which contain manganese steel screening plates. The coke breeze is collected below the screens on one side of the skip bridge by a receiving hopper, which also receives the breeze from the other side by means of a 16-ft. conveyor, crossing under the skip bridge. From this hopper the breeze passes into a self-measuring bucket, which in turn deposits its contents into a skip tub of 26 cu. ft. capacity. On the pressure of a button, the tub is elevated on an inclined runway by means of an electrically operated hoist, and the breeze dumped into a storage bin of 80,000 lb. capacity placed alongside and above one of the cinder car tracks. When a sufficient quantity of breeze has accumulated in the storage bin, it is discharged into a car through two chutes with gates controlled by hand levers operated on the ground level. The hoist control is so arranged that one pressure of the button results in a complete cycle of operation, consisting of raising, dumping and lowering the tub, and the automatic filling of the measuring bucket.

The erection of the new blast furnace required an extension of the existing boiler, power, pump and blowing machine houses, to all of which additions were made. In the blowing engine house, the equipment was increased by a horizontal compound Mesta blowing engine having the high-pressure steam valve gear of double valve type for superheated steam, and the low-pressure steam valve of the Corliss type, designed to be operated at 175 lb. steam pressure and 100 deg. superheat. Steam cylinders are 42 and 84 in. diameter



The Columns Are Spread to Permit the Possible Later Enlargement of the Hearth Diameter. They are also unequally spaced around the circle



Coke, Conveyed by Belt to the Loading Bins, Falls by Gravity into the Electrically-Driven Transfer Buggies

and air cylinder 60 in., with a common stroke of 84 in. It is intended to operate at a normal speed of 60 r.p.m. and a maximum of 75, with a normal air pressure of 18 lb. and a maximum of 25 lb. A Richardson-Phœnix automatic oiling system with a capacity of 500 gal. per hr. furnishes lubrication for this engine, as well as those furnishing the air for the old blast furnace. An independent cold blast main runs to each furnace from the new blowing engine or the two older engines. All engines are served in common by one 96-in. type A Helander barometric condenser and one 12 x 21-in. dry air pump.

The main pumping station located on the Ohio River bank was extended and equipped with two DeLaval and one R. D. Wood single-stage vertical pumping units, each with a capacity of 15,000,000 gal. per 24 hr., operating against a maximum head of 135 ft., including suction. Four other pumps are direct-connected with General Electric motors of 550 hp., supplied with alternating current of 660 volts to run at a speed of 720 r.p.m. The total capacity of the pumping station, including the two older pumps, is now 75,000,000 gal. per 24 hr. To provide against a breakdown of the alternating current lines, and to insure at all times a partial supply of water to the plant, especially to the blast and open-hearth furnaces, a fifth motor is connected to the 230-volt direct current system. A 10-ton Toledo crane has been installed, equipped with 16-hp. and 3-hp. electric motors for the hoist and trolley travel, while the bridge travel is controlled by hand. The intake wells are provided with two Rex traveling water screens, manufactured by the Chain Belt Co., each driven by a 10-hp. direct current motor.

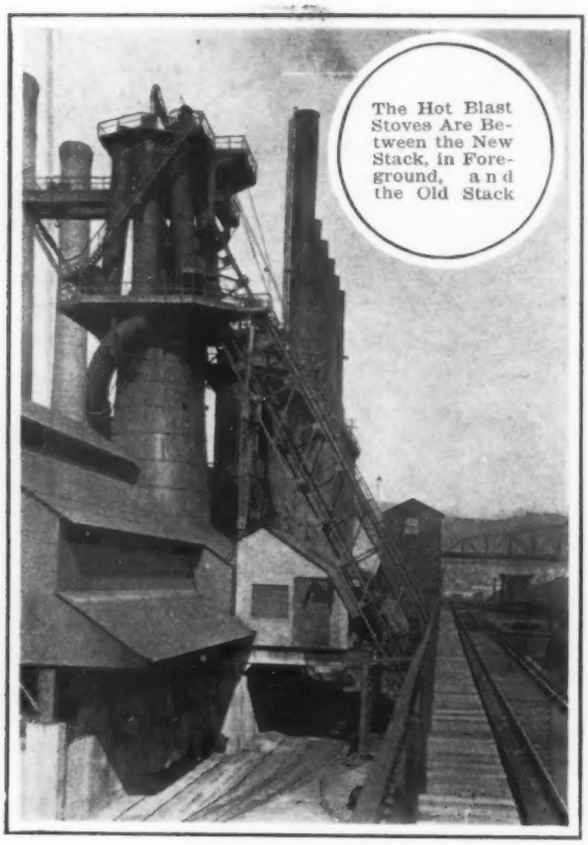
The auxiliary pump house which supplies water to the 100-ft. standpipe for general service was increased by the addition of two DeLaval 16-in. single-stage double-suction horizontal centrifugal pumps, each direct-connected by a flexible coupling to a DeLaval turbine equipped with a standard governor. When operating at a speed of 1200 r.p.m. each pump will deliver 7000 gal. of water per minute against a total gage head of 105 ft., including suction lift not greater than 15 ft., with an efficiency of not less than 78 per cent, requiring 238 brake horse power.

The generating capacity of the power house has been more than doubled by the installation of a 12,500-k.v.a. General Electric turbine generator set, operating on 3-phase, 25 cycles, and 6600 volts, the excitation of which comes from a direct-connected 75-kw., 250-volt generator. The turbine exhausts into a Westinghouse LeBlanc low-level jet condenser, equipped with a 270-hp. non-condensing steam turbine, with provision for the future of a direct-connected motor drive. Cooling air is supplied to the generator by a 33,000 cu. ft. per minute air washer, No. 6-D, type A, manufactured by the Carrier Air Conditioning Co. Provisions are made to take the incoming air from either the outside or inside of the building, and to discharge it partly or entirely to the outside of the building, as conditions may require. A 1000-kw. motor generator set was installed to take care of additional demands of the new blast furnace equipment. For voltage regulation a duplicate K-24 Tirrell regulator was installed. The turbine generators are Y-connected, with the neutral grounded through resistance. A double-bus, double switching system has been employed, using General Electric type H-3 oil switches and auxiliary equipment. From the power house duplicate lines are run to six substations through underground cable feed system.

The boiler house—an extension of the old blast furnace boiler plant—consists of seven 823-hp. Class M-30 Stirling boilers, designed to operate at 200 lb. gage pressure. Each boiler is equipped with Foster superheaters, giving 100 deg. Fahr. superheat to the steam. There are four perforated radial brick chimneys 9 ft. 6 in. in diameter by 200 ft. high erected by the Rust Engineering Co., each designed to remove the flue gases from two boilers. Space has been provided for an eighth boiler, which will complete the battery.

Boilers Nos. 1 and 2 are each fired with six 10-in. Berkholz-Terbeck blast furnace gas burners of the aspirating type with combined primary and secondary air inlets. Water is fed to each boiler by a type "A" Stets boiler feed water controller, designed for a differential pressure of water and steam of 15 lb., the boilers to operate from 100 to 150 per cent of rating. The blast furnace gas is delivered to the old and new gas-fired boilers from the gas cleaners through a brick-lined steel main, 7 ft. 6 in. inside diameter, at a temperature of about 350 deg. Fahr. and a pressure of about 8 in. of water.

Boilers Nos. 3, 4, 5, and 6 are each fired with Westinghouse underfeed stokers of 8 retorts each, designed to burn slack coal, and chain-driven from a line shaft under the floor. A 5 x 6-in. Westinghouse engine is



The Hot Blast Stoves Are Between the New Stack, in Foreground, and the Old Stack

installed at each end of this line shaft, also chain driven, and each engine is equipped with a Ruggles-Klingermann governor, which increases or decreases the engine speed as the steam pressure varies. One engine acts as a spare. Each stoker dumps ashes into a 275-cu. ft. cast iron ash hopper, equipped with Twin Arrow ash gates, which in turn empties into a Koppel steel hopper ash car of 40 cu. ft. capacity. This car is electrically operated, travels through the ash tunnel under the boilers and discharges into an outside ash pit. This pit is directly under a Morgan three-motor traveling trolley bucket crane, operating a 4-cu. yd. Blaw-Knox speedster type grab bucket, which hoists the ashes into an overhead brick-lined ash bin, equipped with chutes to discharge the ashes directly into hopper or side dump cars.

Boiler No. 7 is fired with a motor-driven Coxe stoker, designed to burn coke breeze, and equipped with a Detrick arch with fantail ignition arch. This stoker discharges into a 260-cu. ft. ash hopper, which empties into the ash car.

Boilers Nos. 3, 4, 5, 6 and 7 are equipped with type A Stets boiler water controllers designed for a differential pressure of water and steam of 15 lb. with the boilers operating from 150 to 300 per cent of rating. These boilers also are equipped with Vulcan soot cleaners, each consisting of a two-inch system of six revolving elements.

Each boiler has a Bristol recording flue gas temperature gage and three Hays draft gages. One of these is a direct reading gage indicating the air pressure in the forced draft air distributing ducts, and two are differential gages, one showing the draft in the furnace and the other the draft either at the breeching connection to the boiler in front of the damper or the draft loss from the furnace to the damper.

The flue gas is analyzed by a Hays automatic recording instrument, so designed that it may record the CO_2 from any one of the seven boilers. In order to analyze flue gas from the blast furnace gas-fired boilers as well as from the coal and coke breeze fired boilers, the range of the instrument is up to 30 per cent. In connection with the recording instrument, a Hays portable gas analysis instrument is used to check the CO_2, CO and O_2 in the flue gases.

Boiler feed water is heated in a Cochrane elliptical metering heater, with exhaust steam from the boiler plant forced draft fan turbines, the boiler feed turbines, stoker engines, and the auxiliary pump house turbines. An adjustable 24-in. Cochrane multiport relief valve protects the heater from excessive pressure. The capacity of this heater is 328,000 lb. per hr. The meter consists of a V-notch weir and float, directly connected to an indicating, integrating and recording instrument with a 24-hr. chart clock inclosed in a dust and moisture proof steel case. The meter is elevated to give a positive head of 8 ft. to the boiler feed pumps. To record the water temperature a Bristol recording temperature gage is connected to the inlet and outlet of the heater. The water is delivered to the boilers by three DeLaval 3-stage, 8-in. single suction hydraulically balanced boiler feed pumps each direct connected, by means of a DeLaval flexible coupling, to a 258-b.hp. DeLaval turbine equipped with an excess pressure governor and Copes differential pressure pump governor. One pump will serve the new boiler plant, one the old boiler plant, and the third will act as a spare.

Air is delivered to the five stoker-fired boilers by three No. 5½ R.B. double inlet radial flow forced draft Green Fuel Economizer fans, of 64,000 cu. ft. per minute capacity each, against 5-in. water pressure; two fans are to operate for maximum load, one to be a spare. Each fan is direct connected to a size 3-C, solid type, Kerr turbine, rated at 100 hp. at 1150 r.p.m. Each

The Power Plant Has a Compact Layout of Both Turbine-Driven and Reciprocating Units

turbine is governed by a Ruggles-Klingermann governor which increases or decreases the turbine revolutions as the steam pressure varies.

Fuel is received in two pits, one for coke breeze and one for slack coal. Hopper cars drop the fuel through 3-in. screens into chutes which discharge directly into the pits.

The fuel is then hoisted and dropped into the individual bins, above and in front of each stoker-fired boiler, by a Morgan trolley crane and Blaw-Knox 4-cu. yd. grab bucket.

Steam is delivered from each boiler through an 8-in. pipe to a 16-in. loop header. Each 8-in. pipe is equipped with a Crane non-return valve and a General Electric steam flow nozzle for metering steam flow. At the side of each boiler is a General Electric steam flow meter of the indicating and recording type. The steam distribution lines, from the 16-in. loop header to the shops, coke oven plant, auxiliary pump house, blast furnace, blowing engine, power house and 12-in. tie line, connecting the blast furnace and blooming mill boiler plants, are equipped with Republic steam flow Pitot tubes and meters of the indicating, integrating and recording type, electrically operated and located in the boiler plant pump room. Bristol recording steam pressure and temperature gages are installed on each end of the header. This is necessary because the header is designed so that the coke oven plant may be operated with two or three boilers separate from the rest of the plant, and not receive the steam pressure fluctuation due to change of blast furnace and mill operation.

DRASTIC ACTION PROPOSED

Trade Journals Included in Sweeping Appeal of Department of Justice

WASHINGTON, March 1.—Similar in many respects to the Memphis hardwood lumber case, now pending decision in the Supreme Court, the Department of Justice has filed a bill in equity in the District Court of the United States in St. Louis against the Southern Pine Association, and others, including lumber trade journals. It is based on a report compiled by the Federal Trade Commission and charges violation of the Sherman anti-trust act, alleging combination and restraint of trade. The petition claims that lumber interests urged curtailment in the production of lumber in order to maintain prices, and issued price sheets of a misleading character, statistics as to production, stocks on hand, etc. Trade journals are made a party to the proceeding for having carried material of this kind in their columns.

An idea of the drastic character of the petition is denoted by the request for a preliminary injunction. It is asked that the defendants be enjoined, among other things, from compiling, printing, or distributing any further reports or charts, etc., concerning production of lumber, costs, lists of prices based on such reports, "or any other lists of prices," except lists independently compiled by the several defendants. Also it is sought to prevent further meetings of the Southern Pine Association. Then it is asked that a permanent injunction be issued.

The upholding of contentions of the kind made it is held, would not only prevent all trade associations from issuing figures as organizations which are of vital importance to the respective trades but would prevent trade journals from carrying information coming from the trade regarding markets, production, costs, etc. In other words, this attempt to bridle the press, regardless of its constitutional privileges, if successful, would deprive trade journals of the right to publish statistics, charts, diagrams, etc., of extreme importance to their readers. Trade associations organized for the purposes of gathering in the most harmless way to discuss topics of the greatest concern would be rendered useless and be nothing more than social affairs by being denied the right to exchange views and information that would be of aid to industry and consumers alike.

Railroad Rate Hearing

WASHINGTON, March 1.—Further hearing was held here last week on tariffs under suspension proposing substitution of a 35 per cent for a 33 1/3 per cent increase in rates between Eastern and Southern groups and the Southwest, in which iron and steel articles are among the products involved. The hearing relates to certain rules and regulations of the Interstate Commerce Commission and the propriety of the plan was in question.

Rates on iron and steel articles which were discussed related chiefly to those applying from the Birmingham, Ala., district to points in Texas and Oklahoma. Rates on iron and steel articles from that district to the Southwest, according to Mr. Leland, one of the makers of the tariffs in dispute, have for many years been the same as rates from St. Louis to the Southwest. D. F. Clark of the Central Foundry Co. objected to the fact that a supplemental tariff made by Mr. Leland brought the rate on welded and cast pipe up to 67.5c., or 1c. more than it would be under the rule to increase the inter-territorial rate only 33 1/3 per cent.

Strikes in Leading Countries

That the countries which boast of the most advanced welfare arrangements for workers, Australia and Germany, had the most strikes in the first six months of 1920 is the statement in an article in *Stahl und Eisen*, which analyzes the strike movements in the mining, iron and metal industries in the principal countries of the world during that period. The following table purports to represent the strike movement in the principal industrial countries during the first six months of 1920:

Countries	Persons Involved	Lost Working Days
Germany	985,550	8,896,600
Australia	300,000	7,500,000
France	502,000	7,027,400
United States	395,000	5,895,000
Sweden	167,600	4,506,450
Italy	181,650	3,299,700
Great Britain	235,040	1,761,600
Belgium	67,000	1,078,400
Spain	81,800	875,000
South Africa	40,000	800,000
Austria	52,100	275,200
Switzerland	1,190	18,300
Total	3,008,930	41,623,650

It is stated that the advantages gained by the men were, as a rule, quite small in proportion to the loss of wages. Only in one-third of the strikes were the men wholly or partially successful; two-thirds were complete failures for their side.

Fails to Sell Brass Cartridge Cases

WASHINGTON, March 1.—The War Department for the second time has been unsuccessful in its efforts to dispose of approximately 48,000,000 pounds of brass cartridge cases. The office of the director of sales has announced that the Hess Briggs Corporation, New York, which submitted the highest figures at the opening on Feb. 15, withdrew its bid before an award was made, and that the other two bids, made by the International Minerals & Metals Corporation, New York, and the Standard Iron & Steel Co., New Haven, Conn., have been rejected as being too low in price. One bid was found not to be in accordance with requirements. The question as to the manner of the future offering of the material has not been determined.

G. H. Stickney, Edison Lamp Works, Harrison, N. J., is to read a paper on modern illuminating before the Meriden section of the American Society of Mechanical Engineers on March 18. On April 15, H. A. Winne, General Electric Co., is to discuss electric furnaces.

Proposed Protective Tariff on Manganese Ore

Producers of Ferromanganese Doubt Whether Domestic Mining Industry Can Be Built Up —Statements Made to the House Committee

WASHINGTON, Feb. 28.—Recent hearings held by the House Committee on Ways and Means concerning the free list of the tariff brought out interesting discussion concerning supplies of manganese ore. While makers of ferromanganese were largely in agreement as to the necessary duty on that alloy placed at 2c. a pound, there was a difference of opinion as to the manganese ore situation. Producers of ferromanganese, although not directly opposing a duty on the ore, were inclined to doubt the feasibility of such a plan, claiming that the deposits in the United States are comparatively few and small, as well as remote from furnaces, and gave no encouragement as to the upbuilding of a domestic ore mining industry.

This attitude, however, was sharply challenged by an exceptionally well prepared brief submitted to the committee by Charles W. Potts, Dearwood, Minn., who appeared on behalf of the Northern Minnesota Ore Co., and other mining companies producing ore containing manganese in Minnesota and Arkansas. He made a request for a duty of 35c. per unit of metallic manganese on manganese ores and manganiferous ores, a unit being defined as 1 per cent of metallic manganese in a gross ton; on ferromanganese and spiegeleisen and other alloys containing manganese and other manufactured articles and materials containing manganese, $1 per unit, defined as in the foregoing. He made the provision that a minimum duty of not less than $65 per ton shall be levied and paid upon importations of ferromanganese, and a duty of not less than $20 per ton on spiegeleisen. It was his opinion that the best method of placing a duty is on the unit basis and that it would be impracticable to do it on the ton, ad valorem or pound basis. It was pointed out that manganese ore is sold on the unit basis and that the price of ferromanganese and spiegeleisen is also based upon the manganese content of these alloys, so that there would be less confusion if the tariff be placed upon the same basis on which the ores and allows are sold.

Large Deposits in the United States

In taking issue with the statement that there is not enough manganese ore in the United States in which to found an industry and not enough worth while to protect, reference was made to a report of the Tariff Commission showing that there is a minimum of 800,000 tons of high grade manganese ore in the country, and 17,000,000 tons of low grade, running down to 5 per cent. Of the 800,000 tons of high grade ore, the Government reports give Arkansas about 250,000 tons. Mr. Potts said that in operations of the Northern Minnesota Ore Co. in Arkansas, within the past year, it has produced more manganese ore than the Beltsville-Cushman district or than any other mining company in that district, and said he thought his company had more high-grade ore than is credited to the whole district. With respect to the quantities in Minnesota, the Government says there are 17,000,000 tons down to 5 per cent, but Mr. Potts said that, from his own private reports, blue prints and records, his company has estimated 20,200,000 tons of manganiferous ore, running from 8 to 14 per cent natural manganese, and that out of this 20,200,000 tons of manganiferous ore, on the Cuyuna range, there is 1,700,000 tons that runs 14.50 per cent manganese, high enough for use in making spiegel, and in his opinion the ore could be mined profitably. He stated that if all of the Government estimates on tonnages are comparable to the estimates in the two districts he mentioned, he would be of the opinion that there is 10 times as much manganese ore available in this country as the Government reports have credited.

A conservative estimate for the future annual requirements of manganese ore for the steel industry in the United States, which consumes 95 per cent of the ore produced, was given as 700,000 tons. This was based upon statistics showing the average annual consumption of manganese ore for the five years, 1914 to 1918 inclusive, for the production of ferromanganese was 720,888 tons. The lowest consumption of manganese ore since 1910 was 379,966 tons, used in 1911; while the highest was 942,824 tons, used in 1917. Previous to 1914, it was stated, less than 1 per cent of the requirements came from domestic ores. Owing to several factors, Mr. Potts said, American deposits had not been extensively developed previous to the urgent need of the country growing out of the war. That these factors do not exist now and that the country is able to cope successfully with the situation provided a reasonable protective tariff is enacted in this important infant industry, it was claimed, is a fact easily proved to unbiased minds.

Reasons of Poor Development

Numerous factors were mentioned as having retarded development of domestic resources of manganese. Among them the following were cited: Activity of German and English manganese alloy producers to furnish requirements in a manufactured state and ability of users to get their supply at cheap prices; the fact that most of the known manganese deposits are remote from steel centers, and generally in agricultural regions where the inhabitants know but little of mining methods and receive but occasional encouragement in the production of ore; unstableness of the price of ore, preventing investments in development of manganese properties; cheapness of foreign ore; favorable freight differential from ports of entry to furnace districts over freight rates from domestic mines to furnaces, which still exists against American interests; adverse attitude on the part of American steel producers to change their furnace practice once they had become accustomed to foreign alloys and a prejudice against domestic-made alloys; the belief that foreign deposits were so much greater in tonnage and of higher grade, together with assertion that under no consideration could the United States compete with foreign producers of ore; the belief that American deposits were small, that the grade of ore was inferior and irregular and that domestic sources could not be depended on as a source of supply.

Result of Government Encouragement

Government activities during the war to stimulate production, it was stated, met with immediate response. In 1915 manganese ore was known to exist in about 100 districts in the United States, and at the close of 1918, according to Mr. Potts, it was known to exist in 427 districts. In all, at the close of 1918, manganese ore of merchantable grade had been found in 25 of the 48 states, it was claimed, and Mr. Potts said that so far as he knew in not a single mine has the ore been exhausted. He submitted figures from a Geological Survey report showing production of 35 per cent manganese ore, 10 to 35 per cent ferruginous manganese ore and 5 to 10 per cent manganiferous ore from 1910 to 1918, inclusive. The output of the 35 per cent manganese ore was given as 2,258 tons in 1910 and 305,869 tons in 1918. Mr. Potts contended that unfavorable freight rates can be easily adjusted by the Interstate Commerce Commission when the industry is soundly established and that due to necessity many changes of practice in steel making were inaugurated during the war and much of the old time prejudice by steel makers against new processes and American ores and alloys has been overcome. The

great varieties of domestic ores now available were said to make possible furnace mixtures of as desirable grades as those of any foreign varieties. The alleged former irregular manganese content of domestic ore, it was maintained, has been largely overcome and can be fully overcome by larger operations and the installation of proper equipment for the standardization of grades. That domestic sources can not be depended upon to supply domestic needs was said now to be an absurd argument.

Opposition to the Use of Domestic Ore

WASHINGTON, Feb. 28.—Sufficient protection for the American producer of manganese ore would increase the cost of the ferromanganese to the consumer from $15 to $20 a ton, according to testimony given before the House Committee on Ways and Means by Radcliffe Romeyn, Philadelphia, of the American Manganese Mfg. Co. For domestic producers of ferromanganese to use home ores, it was stated, it would be necessary to consume three times as much ore to make a ton of ore, as compared with two to two and one-half tons of imported ore. It was the opinion of Mr. Romeyn that it is not economical or practicable, from a manufacturing standpoint, to try to use domestic ore, unless the people working the local deposits can invest heavily in installing mining equipment and he said they are not in favor of doing that because of the great uncertainty as to how much ore they have. Moreover, he said, they have a freight rate of $12 to $17, while the British have a freight rate to the Atlantic seaboard of from $2 to $3.

Asked by Chairman Fordney as to the cost to the steel maker for ferromanganese in the production of a ton of steel, Mr. Romeyn said it required an average of 17 lb. of ferromanganese to a ton of steel, and that the price of the alloy on the day he appeared before the committee was $110 a gross ton, delivered. He said the answer was a matter of arithmetic and Representative Hawley using these figures said the ferromanganese cost in a ton of steel would be 5c a pound and for 17 pounds the cost would be only 85c for the required amount of this alloy in a ton of steel.

Chairman Fordney told Mr. Romeyn that the committee proposes to put in the bill a provision which will prohibit foreign producers of ferromanganese from selling their product below the cost of output. Mr. Romeyn said that under such a condition domestic producers could continue to manufacture, but insisted on immediate protection, 2c a pound being suggested. The chairman stated that the committee might incorporate a provision imposing an ad valorem duty on the American wholesale selling price instead of the foreign value, and this, Mr. Romeyn said, would be helpful, the seriousness of the exchange situation having been pointed out. He said the British during the past few months imported into this country a great deal of ferromanganese and they were enabled to make a 20 per cent profit after paying shipping costs due to the status of the exchange.

Mr. Romeyn said any tariff on manganese ore would be inadequate unless it is high and when 2c a pound on ore was suggested by Representative Oldfield, it was stated by Mr. Romeyn that such a duty would be impracticable becouse three tons of domestic ore are required to make a ton of ferromanganese and the producer of the alloy would need three times that duty. Chairman Fordney pointed out that the imports of ore for 1918 carried an average price of $30.30 a ton, for 1919, $35, and for 1920, $20.50, or approximately 1c a pound. He suggested that if ferromanganese sells for 5c a pound and 17 pounds is used in a ton of steel, it would not make a great difference to the ultimate consumer. Mr. Romeyn replied that it was necessary to consider that the ferromanganese maker must be assured of an ample supply of ore and if imports are shut off and British alloy also shut off, steel interests would be in a dangerous position.

History of the Industry

In giving a history of the ferromanganese industry in the United States, Mr. Romeyn said:

The first company to make ferromanganese in the United States was the American Manganese Mfg. Co., with furnaces at Dunbar, Pa. During 1914 it equipped its furnaces which had previously been making pig iron and started the production of ferromanganese.

In 1917, Edward E. Marshall obtained control of Lochiel furnace at Harrisburg, Pa., and also became a producer of ferromanganese.

Early in 1916, E. J. Lavino & Co., of Philadelphia, took over a furnace at Sheridan, Pa., which had been idle for some time, as it had been shown that due to its geographical location and increased freight rates, it was not economically situated for making pig iron. Subsequently, this same company acquired furnaces at Marietta and Lebanon, Pa., as well as Reusens, Va. These plants were all remodeled and equipped for making ferromanganese, and by the end of 1917 these four furnace plants were combined in the Lavino Furnace Co., which has been operating continuously since then.

After our entrance into the war, the Miami Metals Co., Chicago, acquired and equipped the Iroquois Furnace, in the Chicago district. The Southeastern Iron Corporation purchased a furnace at Goshen, Va., for the same purpose. Other producers who entered this field, making a total of 10 companies, were:

Burden & Baldwin, with furnaces at Troy, N. Y.

Southern Manganese Corporation, with furnaces at Anniston, Ala.

Anaconda Mining Co., with furnaces at Butte, Mont.

Seaboard Steel & Manganese Corporation, with furnaces at Temple, Pa.

Edward E. Marshall, of Philadelphia, with furnaces at Anniston, Ala.

Graham, Va., in addition to Lochiel furnace at Harrisburg, mentioned above.

Juniata Furnace & Foundry Co., Newport, Pa.

Five out of the above six companies have continued to remain in business. The Juniata Furnace & Foundry Co. has not been able to operate, due to English competition, but the plant and organization are ready to resume making ferromanganese as soon as a protective tariff becomes effective. After the armistice, due to the tremendous reduction that was made in the price of ferromanganese by the British producers, who were trying to regain their market in the United States, Burden & Baldwin, Seaboard Steel & Manganese Corporation, Southeastern Iron Corporation and the Anaconda Copper Mining Co. were compelled to discontinue operations. The Miami Metals Co. sold the Iróquois furnace at Chicago to the Steel & Tube Co. of America. This concern has been operating this plant intermittently since then, making ferromanganese for their own consumption. Since the armistice there have been five companies of the original 10 that have produced ferromanganese for domestic consumption only and have had to sell their product at considerably below the cost of manufacture for a good part of this time in order to compete with the British producers. These merchant producers are as follows: American Manganese Mfg. Co., Lavino Furnace Co., Steel & Tube Co. of America, Edward E. Marshall, and Southern Manganese Corporation.

The following officers were elected at the annual meeting of the Kilbourne & Jacobs Mfg. Co., Columbus, Ohio. President, J. R. Kilbourne; vice-president and general manager, H. B. Hileman; treasurer and comptroller, C. E. Roth; secretary, F. C. Eaton; asst. secretary, Rutherford Fullerton. President Kilbourne announced that the company had a very satisfactory year in 1920, and anticipated that the present year would be the largest in the company's history.

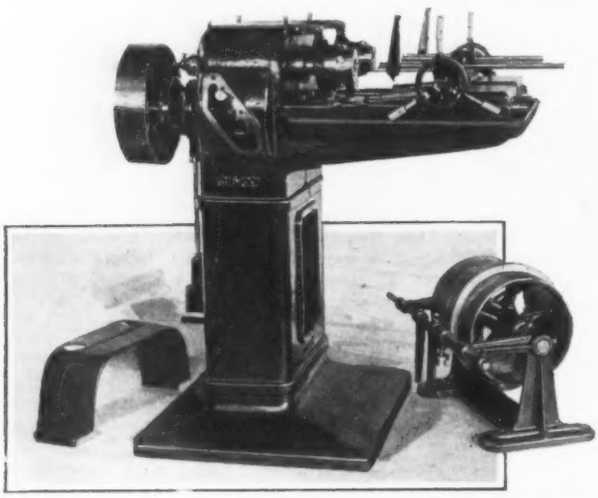
The Power Gas Co., organized by A. B. Caldwell, Memphis, Tenn., and T. J. Taylor, Sardis, Miss., for the purpose of manufacturing high-power gasoline, will erect an office building and storage tanks at Ivorydale, Cincinnati, five acres of ground having been leased from the Big Four Railroad for this purpose.

Strickland Kneass, Jr., steam engineer of the Youngstown Sheet & Tube Co., Youngstown, Ohio, on Feb. 28 addressed the initial meeting of the steel works section of the Engineers' Society of Western Pennsylvania, at the William Penn Hotel, Pittsburgh, on "Distribution and Use of Coke Oven Gas."

Double Spindle Threading Machine

A ¾-in. double spindle threading machine, designed primarily for work on which the threads are long enough to give the operator time to chuck and start one piece while the other is being completed, has been placed on the market by the Geometric Tool Co., New Haven, Conn.

With this machine a number of threading combinations are possible. For instance, both spindles may be fitted with die heads for external threading only, or with taps for internal threading. Again, one spindle may carry a die head and the other a tap for work



The Geometric ¾-In. Double Spindle Threading Machine. The spindles can be driven independently by means of the gear change levers at either side

requiring both an external and internal thread. The same combination may also be employed for separate external and internal threading.

For tapping sizes smaller than practicable with a collapsing tap, best results are obtained by fitting the machine with a ball drive reversing tap holder, which, together with a collapsing tap and a self-opening die head, furnished on specification, gives this machine a tapping range of from ⅛-in. up to 3-in. diameter when the pitch of thread is fine, and will thread diameters ¼ in., ⅜ in., ½ in., ⅝ in. The greatest length that can be cut at one setting of the work is 8½ in., but with resettings 14-in. lengths can be cut. When ½-in. standard pipe thread cuts, or ⅞-in. S. A. E. standard spark plug threads are desired, a 1-in. die head is fitted, but 1-in. standard bolt thread cuts are not recommended. The machine is also fitted with a 2¼-in. Geometric rotary die head for cutting fine pitch threads on brass tubing and work of a similar nature up to 2¼-in. diameter.

The carriage is fitted with a two-jawed chuck, hand wheel operated and special bushings or holders can be furnished for various classes of work. An adjustable swinging gage on the side of the carriage provides the means of setting the work for predetermined lengths of thread. An adjustable stop in the trip rod ahead of the carriage governs the opening of the die head and the length of thread to be cut. An adjustable stop at the back of the carriage controls the closing of the die head. Change gear levers on the sides of the machine control the spindle speeds independently and may be set. Speeds are indexed correctly for the general run of work, but may be influenced by the nature of material worked. A number of sets of chasers are required to cover the threading range of the machines.

The weight of this machine is 820 lb. net and the floor space required is 31 x 45 in. The two spindles are mounted on large bronze bearings and driven by a single pulley at the rear of the machine, but can be driven independently by means of the gear change levers located at either side. A single geared pump is provided for supplying oil to the work. The countershaft driving pulley and its idler are 12 x 4 in. The countershaft has a speed of 373 r.p.m. and weighs 140 lb.

Foundry Buildings Discussed

O. D. Conover, assistant chief engineer of the Austin Co., Cleveland, was the speaker at the regular monthly meeting of the Pittsburgh Foundrymen's Association, held at Hotel Chatham, Pittsburgh, Monday evening, Feb. 21. Mr. Conover's subject was "Modern Foundry Buildings," and his remarks were in part as follows:

The modern foundry building is something more than merely a shelter for the help and the equipment. Its purpose is too general to be confined within narrow limits. For instance, the supporting of cranes, trolleys, monorails, line shafting and other equipment are a few of the diversified uses.

Because of the many classes and sizes of foundries, together with the many uses to which the buildings are put, it is impossible to confine them to a few types, and for that reason considerable thought and attention has been given to their development, design and construction.

The older types of foundry buildings, hardly without exception, were low, poorly lighted and ventilated and devoid of proper sanitary facilities, rest rooms or heating. Having been built low, the installation of modern equipment usually was impossible, and the advent of the overhead electric traveling crane, as well as the monorail system, threw many of these buildings into the obsolete class. Other changes, such as the substitution of structural steel for timber, the replacing of rubble masonry or brickwork by concrete, the steel sash in place of the wooden sash and many other well-known substitutions, have had a marked effect in changing the whole character of the building, so that the contrast between the old and new is very definite. The improved designs of various industrial buildings as they are developed from time to time directly or indirectly benefit foundry construction. As these improvements are developed they are readily adopted in foundry construction, if suitable for the purpose, and various code or insurance requirements many times make this necessary.

First Considerations in New Project

It is essential that importance of plant location, railroad facilities, classification of foundry, capacity, process mapping, selection and arrangement of equipment, operation, investment and anticipated profit should be considered before the actual design of the building has been decided upon. The design of the building usually suggests itself after due consideration has been given to these features. Very much complicated or special plants are an exception. For these it is sometimes necessary to create something new and oftentimes novel designs, always adhering to the accepted practice where possible and using the process of elimination after several designs have been studied.

To do this properly it is necessary that the designer have an intimate knowledge of foundry requirements, as well as that of being familiar with modern foundry construction. As a matter of fact, it takes an engineering corps to do it properly, except for smaller plants. By so doing each of the trades involved is represented by an engineer conversant with the requirements and practices, and time and money are saved by the short and direct cut to a plant which will produce the desired results.

The modern foundry building is the result of close observation in determining the needs of foundrymen. As a result, certain types of construction have been accepted generally, and as a natural consequence those most commonly used have been more or less standardized. Standardization, however, does not imply total disregard for plant layout. Only where standard buildings or equipment meet the necessary requirements should they be considered.

Lantern slides were shown of the various types of buildings, and the discussion revolved about the matter of costs. On account of the decline in prices of materials, costs were not so high, Mr. Conover stated, as they were recently, but owing to the fact that labor costs had not declined materially the recession as yet had not been important.

Increased Charges On Iron Ore Shipments

Interstate Commerce Commission Declines to Suspend Tariffs Filed by Michigan and Wisconsin Railroads—Far-reaching Effects Expected

WASHINGTON, March 1.—Increased line haul rates and dock charges on iron ore shipments from mines in Michigan and Wisconsin to Ashland, Wis., and Marquette and Escanaba, Mich., became effective Friday, Feb. 25. Entirely to the surprise of the shippers, the Interstate Commerce Commission declined to suspend the tariffs advancing the charges, as had been asked by the Lake Superior Iron Ore Association, through its counsel, Attorney Jean Paul Muller, Washington, and by others. There does not seem to be any probability of these rates being either suspended or held unreasonable before the lake navigation seasons opens, and consequently they will apply to shipments from the old ranges. This will mean increased costs of making pig iron by blast furnaces using ore from those ranges. It will run production costs on a ton of pig iron up about 30c. a ton, in view of the fact that the increased rates and dock charges for the most part amount to 15c. a ton. Such a development is held to be distinctly harmful at this time when the iron and steel market readjustment process is being so earnestly sought and with considerable difficulty to producers. One of the principal bases on which producers were hoping to bring about a complete readjustment on a profitable basis was a reduction in ore rates now in effect. Instead of this, they are confronted with higher rates, with all that means to the costs, which, it has been shown, are greater to some producers than their selling prices.

Effect on Mine Operations

It seems altogether likely, in the opinion of the trade, that owing to the action of the commission in allowing the advance schedules to become operative, operations of mines in the old ranges and shipments from them will be sharply curtailed and that this will be reflected in smaller blast furnace and steel works output in the face of low production at present and the struggle under way to recover from restricted production. At the same time, another effect, which is expected to offset curtailed production, is said to be the probable increased shipments from the Minnesota mines, on which rates were not increased. These mines are served by United States Steel Corporation railroads.

The new rates increase the line haul from the Gogebic and Menominee ranges from 80c. to 90c.; from the Gwynn, Princeton and Republic districts of the Marquette range from 70c. to 75c. and from the Negaunee district of the Marquette range from 60c. to 65c. The 90c. rate applies to Ashland, Marquette and Escanaba, and the 75c. and 65c. rate to Marquette. The dock handling charge in all cases is increased from 5c. to 10c.

"Substantial Damage" Claimed

It is considered to be remarkable that, before the complaint filed last December against the then existing rates could be tried on its merits, the carriers serving the old ranges proceeded to file still higher rates. It is held to be equally as remarkable that the commission has allowed them to become effective. Under rules of the commission it is not required to suspend rates unless it can be shown that "substantial damage" will be done. Shippers are firmly of the conviction that "substantial damage" will be done, and it is even said that the suspension board, which had before it the protests against the latest tariffs, recommended suspension, but the commission overrode its suggestion. This has occasioned wonder as to what the attitude of the commission may be on the protest filed last December and the outcome of the hearing on it which is to be held in Chicago before Examiner A. R. Mackley. The fact that this hearing, originally set for March 12, has been postponed until some undetermined date in May, in any event means that the recently advanced rates will become effective, judging from present indications, because by that time the lake shipping season will have opened, and, moreover, it will require considerable time before the case is passed upon finally, and meanwhile contracts for ore will either have been made, unless, due to the complicated situation, they are withheld. Of course, if the hearing based on the old protest results favorably to the shippers, the new rates would be eliminated automatically.

Only One Course Remains

Apparently the only thing that remains for the shippers is to file formal complaint against the recent advances. The consequence of this on shippers is that those who already have sold ore for 1921 delivery in the expectation that rates at least would be no higher than those applying in 1920 will have to lose 15c. a ton or 10c. a ton, as the case may be, on all ore for which contracts have been made. Also it is contended it will mean that Michigan-Wisconsin mine operators will be able to sell much less ore for delivery this year in competition with Minnesota operators, as the former no longer enjoy the 15c. differential per ton which has been in effect for many years. Likewise, the Michigan-Wisconsin operators are paying $7.50 per locomotive-hour, or $75 a day, for assembling service at the mines, which does not apply to Minnesota operators. The situation created is held to be both unprecedented and anomalous for iron ore history. It has been pointed out that the rates from the old ranges in Michigan-Wisconsin on leaner ores and for shorter hauls become higher than the rates from Minnesota mines on richer ores and for longer hauls. It has been estimated that the situation will bring about a shrinkage in 1921 shipments from the old ranges amounting to 25 to 50 per cent, causing an actual loss rather than a gain in revenue to the carriers affected and at the same time giving additional revenue from increased shipments from Minnesota mines. Shipments from Michigan-Wisconsin mines in 1920 totaled 18,950,000 tons, as compared with 39,570,000 tons from the Minnesota mines, the percentages being approximately 32⅓ and 67⅔.

Merger Agreed Upon

At the conclusion of the meetings of the boards of the Dominion Steel Corporation, and the Nova Scotia Steel & Coal Co., recently held in Montreal, Que., it was announced that directors of these companies had arrived at an agreement for the consolidation of the Dominion Steel Corporation, Ltd., the Nova Scotia Steel & Coal Co., and the Halifax Shipyards, Ltd., under the name of the British Empire Steel Corporation, Ltd. The agreements are subject to the underwriting of certain securities, upon the completion of which the boards of the companies will again meet for the purpose of approving the underwriting and fixing the date when the agreement will be laid before the shareholders of the interested companies for their approval.

SHEET MILLS RESUME

Activity Not Expected to Be Permanent—Much Uncertainty as to Prices

YOUNGSTOWN, OHIO, March 1—To work off an accumulation of sheet orders aggregating several thousand tons, operating schedules of Mahoning Valley mills were revised this week to include 44 active units, as compared with six the week before, and incidentally the low point. While inquiry is more active in the principal lines of steel manufacture, business is still being withheld to a large degree. The market is largely indefinite, prices being determined to some extent by expediency. Valley steel-works blast furnaces continue to pile output and such interests are reported to have sold an aggregate of 8000 tons of standard basic iron within the past two weeks at an average price of $26, Valley. With only 17 of 46 blast furnaces active in the Mahoning and Shenango Valleys, production of iron is at the lowest point since the steel strike of 1919. Republic Iron & Steel Co. has banked No. 4 furnace in the Haselton group, leaving only one of six stacks in this battery in commission. The Carnegie Steel Co. has blown out No. 2 furnace at the Ohio Works for relining and No. 3 at the New Castle plant is out of blast. With 26 of 66 open hearths in the Mahoning Valley charged, the rate is unchanged over the previous week, 14 of the active units being operated by independent interests.

Expanding finishing operations are not interpreted, however, as indicating any permanent improvement, but rather the working off of accumulated tonnages placed by buyers against actual business. Much of the business in sheets was booked by the mills in anticipation of the wage reduction for operatives working under the sliding scale of the Amalgamated Association of Iron, Steel and Tin Workers, which will become effective from March 1. The new wage rate will be determined at the bi-monthly settlement about March 10 at Youngstown, and it is expected will show a reduction of from 10 to 12 per cent from the rate paid in January and February.

Business is generally picking up with fabricating interests and while large orders are generally being held up, due to the uncertainty over the price situation, the aggregate of small orders placed in February is an encouraging index of the demand, which promises to become more pressing as building opens up. Two such interests in the Valley state that February proved a very satisfactory month, much better than January, owing to the large number of small orders that were worked off.

Prices Uncertain

While the range on plate prices is from 2.15c. to 2.25c., it is believed that a firm bid would bring a price under 2.10c., and that a heavy tonnage might bring a price around 2c. These figures compare with the Steel Corporation price of 2.65c.

In the sheet market, the same uncertainty exists and the situation may be aptly characterized as indefinite, as makers are quoting different prices, depending upon the nature of the order, past relations with the buyer and other considerations. Though black sheets are generally holding around 4c., one important producing interest ventures the opinion that they must settle to 3c. before consumers will confidently re-enter the market. This concern believes there must be further liquidation in prices of other finished products, all along the line, to materially stimulate buying. Such a price, as quoted, compares with the Steel Corporation base of 4.35c. on black sheets, and with 6.50c. to 7c., the prices which prevailed for a number of months in 1920, when independent interests were unable to meet the demand and the makers were in complete domination of the market.

Other interests, on the contrary, believe that prices will eventually swing back and declare in no uncertain terms that there must be further recessions in costs if there is to be any additional slashing of prices.

The pig iron market is still sluggish, the most conspicuous development being the activity displayed by steel-works furnaces in offering accumulated tonnages. Several thousand tons of off-grade basic were recently sold at $24, Valley furnace.

The broader demand for nails and wire products is reflected in improved operations of the leading maker, the demand centering on fence wire and nails in anticipation of the resumption of building in the spring. The price of nails is uniformly $3.25 per base keg.

MR. WILLIAMS COMPLAINS

Comptroller Does Not Like the Way the Steel Corporation Conducts Its Business

Severe criticism of the United States Steel Corporation on account of its failure to reduce prices is made in the letter which John Skelton Williams, Comptroller of the Treasury, mailed to Judge E. H. Gary, chairman of the corporation, last week. Judge Gary has since stated that he did not care to comment on Mr. Williams' letter except to say that the prices of the United States Steel Corporation were those approved by the United States Industrial Board after all facts and figures were ascertained in March, 1919. Mr. Williams, he said, was familiar with all those facts.

Comptroller Williams's letter is in part as follows:

We are calling on the working people to accept reductions of wages. Every day we urge manufacturers and wholesale and retail merchants to trim their margins of profit to the thinnest possible with safety, and the farmers to be content without profit or to accept losses. In my office I apply every proper influence to urge the national banks and the Federal Reserve Banks to be content with smaller returns, to encourage enterprises and stimulate legitimate business. Evidence that the United States Steel Corporation is selling its products at reasonable prices and accepting smaller profits would be an example and inspiration to all these classes, an impetus of immeasurable power to the process of hastening healthy readjustment by mutual and general concessions.

I realize your desire as an executive to do the best possible for your stockholders. I contend, however, that profits for them such as you gathered in during the war years were not "reasonable," and in the present condition of the country that your prices are excessive and unjustifiable. I ask you to consider, looking to the permanent welfare of the corporation and its stockholders, whether the public good-will you would gain by such reduction of prices as the figures I have and the undisputed calculations and conclusions I get from them would justify, would not be an asset far outweighing the immediate loss in profits. I ask you, also, to consider whether the public and general hostility your corporation would incur by insisting on a policy of extortion while other interests and individuals are being exhorted to a policy of reduction, and by refusing to come to the help of the country and the world at their time of need, will not become a heavy and increasing liability.

TREMENDOUS OPPORTUNITY

It seems to me, from the facts and figures I have, that the huge and rich corporation over which you preside and for the policies of which you stand responsible now and will stand responsible in history before posterity, has a tremendous and unprecedented opportunity for doing good or harm to the commerce of the United States and of the world and to the peoples of both. All the diabolic cunning and striving of the Bolsheviki of Russia can do comparatively little harm here; little toward creating revolutionary and destructive impulse compared with the effects of insistence by a great corporation in our midst, such as yours, supposed to represent not only capital but character and brains, on using the power given it by circumstances and the law to exact the last hair's weight of its pound of flesh.

No insidious, sneaking propaganda of high-brow or low-brow apostles of ruin could put in the popular mind so much poison as refusal by such a corporation to do its part toward solving a great and difficult problem, reviving industry and business activities and promoting prosperity and the peace and happiness of humanity.

Further Wage Reductions Are Expected

Close Relations of Prices and Pay of Workers in Mahoning Valley—Jones & Laughlin Steel Co. Makes Reduction of Twenty Per Cent

YOUNGSTOWN, OHIO, March 1.—That a further reduction in wages in the Youngstown district is not an improbability, following the 20 per cent cut, effective Feb. 16 and affecting all classes of workers, is ventured by a leading interest.

Though prices have been reduced to levels which some independents thought would not be attained in six months to a year, these price concessions have almost completely failed to stimulate or affect buying. In this respect the price recessions have been disappointing from the manufacturer's standpoint. The inevitable conclusion to be drawn from such a situation is that buyers do not believe the bottom has yet been reached, and hesitate to enter the market for large tonnages in view of this belief, especially since it is generally conceded there is a large overhanging demand.

This, in fact, is one of the principal situations confronting the iron and steel market and is acting as a powerful deterrent against buying.

Suggestions, therefore, emanating from some of the leading manufacturing interests that prices will have to be forced still further downward are viewed as having special bearing at this time. Some interests claim that, at present costs, prices have been reduced to bedrock as far as profits from operations are concerned. They intimate that if the pressure of buyers is firm enough to force still further reductions, these cuts must be passed along the line and must be absorbed in manufacturing processes.

It is pointed out that the common labor rate of 37c. in the Valleys compares with 30c. paid in certain plants in the East and with 33c. in Buffalo. In this district the basic eight-hour day was retained, time and a half being paid for overtime. In some others, where a lower wage rate prevails, the basic eight-hour day has been eliminated and straight time is paid for any number of hours worked.

It is also considered altogether likely that the dominant steel groups will attempt to force a downward revision in freight rates, contending that the railroads are no more entitled to existing high revenues than are manufacturing interests, in view of lower costs of operation. There is already considerable discussion to this effect, as to the best ways and means to proceed. Assembly costs constitute a larger item than ever before in pig iron production, and consequently in the production costs of finished materials.

There is one group of steel manufacturers which is willing to go the limit in meeting the price ideas of the buying public. If the new prices being quoted generally by the independents are regarded as still out of line, this group is willing to make further concessions, and will be compelled in time to pass on the reduction to the actual producing units. This element would be influential enough, it is felt, in capacity to have a widespread effect on the market and to force competitors eventually to meet its position. It realizes that idle capacity is costly and is frankly doubtful whether the price liquidation has reached its limit. It is willing to recede to a point where prices will bring buyers into the market, and either adjust costs proportionately or quote prices that may revive demand to the point where competition for material will force prices upward again.

Accordingly, another wage reduction in the Mahoning Valley, affecting the general class of workers, is not wholly unlikely.

Wage Scale Involved

UNIONTOWN, PA., March 1—First definite negotiations involving basic wage scale consideration developed in the Connellsville region this week when a prospective buyer opened negotiations for a large tonnage of coal on the basis of the 1919 wage scale, approximately 35 per cent under the present scale. The negotiations, however, have not reached any conclusion. This is the only development of the week in the wage discussions which are continuing among independent operators. However, they apparently have determined to abide by their intention of "waiting it out" for the next three weeks or so in the hope that by that time some action will be taken by the H. C. Frick Coke Co., subsidiary of the United States Steel Corporation.

In the meantime, no announcement or statements of any kind are forthcoming in Frick circles. The Frick company's coke production was still further curtailed last week, operations now, according to the best advice available, being about 65 per cent on coke. Not much change has been made in the coal production of the company.

Receivership Aftermath of Wage Decision

A receiver has been appointed for the Atlanta, Birmingham & Atlantic Railroad. The action was taken in the federal court at Atlanta on the petition of a Birmingham bank, which alleged it held a note due March 7, which the road was unable to pay. The railroad agreed to the receivership. In its petition the Birmingham bank stated that while the road's gross receipts were $9,000 per mile per year it was losing $100,000 per month and that its only salvation was for the court to take charge. The receivership proceedings are a sequel to the announcement of the company on Jan. 1 that wages would be reduced on Feb. 1, and the subsequent protest of the employees to the Railroad Wage Board. Sitting at Chicago on Feb. 21, the board decided that a carrier's financial condition could not be regarded as a factor in the determination of just and reasonable wages until a conference of the railroad and its employees had failed to result in an agreement on that question. The board remanded the dispute between the railroad and its employees for further conference between them, declaring that it was without jurisdiction as the matter stood.

Protest of Union Labor Effective

WASHINGTON, March 1.—No surprise was occasioned by the action of the Senate Committee on Manufactures last week in reporting out the so-called Calder coal regulation bill in a form which is vastly different from the original draft. This was due entirely to the objection of organized labor to the idea of Federal control and operation of the industry during emergencies. These were two of the fundamental purposes of the bill when it was drafted, yet both these features were eliminated, as were the tax proposals designed to eliminate excess profits in coal dealings. The only semblance the measure has to its original form is a requirement for full and current publicity on coal mining costs and profits, to be compiled by the Federal Trade Commission. While the bill never had any important support as a safe or logical piece of proposed legislation and its defeat was considered both desirable and probable, its changed form is not due to that fact, but to the protest of organized labor, which was afraid that Federal control would prevent workers from exercising their right to strike.

Recommendation was made that the bill pass at the present session, but apparently there was no serious belief that this could be done.

INTERNATIONAL ASSOCIATION

Plans Discussed at Institute Meeting—No Change in United States Steel Corporation Policy

At the regular monthly meeting of the directors of the American Iron and Steel Institute held at the Metropolitan Club, New York, Feb. 25, the plan which has long been under consideration for the organization of an international association of steel manufacturers to promote friendship and business co-operation in matters connected with foreign trade was considered at length.

Judge Gary, president of the institute, was empowered to conduct such correspondence as may be necessary to make the association a reality. After the meeting, Judge Gary said that the plans of the American steel makers would be presented formally at a meeting of the institute next October. Invitations will be sent to steel makers in all countries doing business with the United States, including the European nations, Japan, China and South America and South Africa, to become connected with the new association.

When Judge Gary was asked in regard to prices, he said, "Prices were discussed only in a casual way. No proposition was made to change the present situation."

Members of the board of directors left the meeting with the distinct impression that the Steel Corporation will not lower wages until the cost of living is materially reduced and that there will be no change in the Steel Corporation price schedule in the near future.

Reduced Prices Quoted to the Government

WASHINGTON, March 1.—Recent reductions in prices made by independent steel companies were reflected in bids opened by the Bureau of Supplies and Accounts, Navy Department, last Friday. They involved 350 tons of base gage plates 60½ to 96 in., 190 tons of medium rivet rods and 240 tons of reinforcing deformed steel bars. The Cambria Steel Co. submitted a bid of 2.80c., delivered Philadelphia, on the plates, which, allowing for the 10c. per 100 lb. extra for Navy specifications, is equivalent to 2.35c. base, Pittsburgh. Recommendation has been made that this company be awarded the contract. Delivery is promised in 15 to 21 days. The Cambria company also was the lowest bidder, making a guarantee on the rods, ⅜ to 1-in. 15 to 18 ft. at 2.70c., delivered Philadelphia, or equivalent to 2.25c. base, Pittsburgh, after allowing for Navy specifications. Delivery is promised in 21 days. The Corrugated Bar Co., Inc., Buffalo, was the lowest bidder on the deformed bars, wanted for delivery at Hampton Roads and Sewall's Point, Va., its bid being equivalent to 2.30c., base, Pittsburgh. Other bidders on the plates and the equivalent Pittsburgh base prices were the Brier Hill Steel Co., 2.65c.; Carnegie Steel Co., 2.65c.; Lukens Steel Co., 2.65c.; Worth Steel Co., 2.65c. Bidders on the rods other than the Cambria company and the Pittsburgh base equivalents were Bethlehem Steel Co., 2.41c.; Carnegie Steel Co., 2.35c.; Crucible Steel Co., 2.35c.; Jones & Laughlin Steel Co., 2.35c. The Pittsburgh base equivalent of 2.23c made by Thomas R. Heyward, Pittsburgh, who named the Youngstown Sheet & Tube Co. as the maker, was not considered because the bid was not accompanied by a guarantee.

The open-hearth department of the Steelton, Pa., plant of the Bethlehem Steel Co., after being closed for several months, was placed in operation last week to fill an order for rails recently received. Several departments of the Central Iron & Steel Co., Harrisburg, have also resumed operations.

RAILROAD WAGE CUT DEMAND

John A. Topping Holds Railroad War Rates as High Obstacle to Recovery

John A. Topping, chairman Republic Iron & Steel Co., in an interview in the *Magazine of Wall Street* on the outlook for iron and steel, put a great deal of emphasis on the need of readjusting transportation from a war to a peace basis. Slow recovery, he said, is under way, stocks are being reduced and demand is accumulating, but "this big country cannot long maintain itself with purchases of iron and steel on its present restricted basis. Steel prices to-day are on a bargain-counter basis, and I believe demand will be greatly stimulated when all obstacles to reconstruction are removed, the most important being, from a world-trade standpoint, the settlement of the German war indemnity, but the other, from a domestic trade standpoint, being of equal importance, namely, the readjusting of transportation from a war to a peace basis.

"The railroad problem," he continued, "is a practical one of reducing the most of conducting transportation to more nearly the pre-war level, and to accomplish this the railroads must have not only the co-operation of labor but of all other interests. The general liquidation which has taken place in commodity values has been a substantial help in reducing costs of conducting transportation. This is notably true of coal, iron and steel supplies. Labor, however, the largest single item, has not responded, but should do so in its own interest, otherwise traffic will continue to shrink in volume, and unemployment will be emphasized. Aside from reasons of employment, labor should make its contribution to cheaper cost of transportation, because labor rates during the war advanced out of proportion to the increased cost of living."

Wages and Living Costs

Mr. Topping emphasized that labor rates since 1914 were advanced 165 per cent, whereas the National Industrial Conference Board reports for the same period that cost of living advanced 104.5 per cent. "On the other hand, the United States Bureau of Labor shows that January, 1921, living costs, measured by wholesale prices, are down 35 per cent, and by the retail standards 14 per cent, with retail prices rapidly shrinking." The labor rates in effect at most steel works of this country are now, he pointed out, about 90 per cent above 1914 rates, whereas living costs are 77 per cent higher.

Present freight rates, he continued, are war rates, "and everyone knows they cannot be maintained, and buyers are withholding purchases in anticipation of readjustments which railroad executives have publicly admitted *must be made to stimulate traffic.* The importance of iron and steel to railroad traffic is not fully appreciated by the public," he added, "but its importance is suggested when it is considered that it requires 6 tons of raw material movement inbound to produce 1 ton of outbound finished product, and therefore the present war schedule of freight rates with advances on the different iron and steel commodities which range from 90 per cent on long hauls to 300 per cent on some short hauls, is not only restricting traffic, but adversely affecting railroad revenues and working a great injury to the great army of workers in the independent steel trade. Anything that will help railroad revenue, will stimulate steel demand."

Need of Low Export Rail Rates

For future export trade Mr. Topping holds that freight rates below domestic rates will be necessary when European production begins in earnest, "as we will not only have to compete with cheaper labor, but a depreciated mark, franc or shilling, and these disadvantages will weigh heavily against us without railroad freight co-operation."

The Independent Bridge Co., Pittsburgh, has started construction of buildings to double the capacity of the Sharpsville Boiler Works Co., Sharpsville, Pa.

CONTENTS

Production Methods of Rolls-Royce Plant 555

How an Automobile Factory, Operating Along Lines Found Practical in English Works, Schedules Machining of Parts

The Country's Pig Iron Making Capacity 560

In Excess of 51,000,000 Tons Per Annum of Coke Iron—Next Four Years Call for Twenty New Stacks If History Repeats Itself

Machine Tool Builders Meet in Cleveland 563

Uniform Cost-Accounting Plan—Activities of Association—Waiting Attitude in Respect to New Business

Steel-Making Economies Receive Attention 565

Electrical Engineers at Chicago Discuss Steel Processes—Electric Furnace and Fuel Cost Considered

Setting a Task for the Salesman 567

Taylor Society Discusses Quota System for Laying Out Work of Sales Department

New Blast Furnace Recently Completed 571

Six-Hundred-Ton Furnace Doubles Pig Iron Making Capacity at Midland Plant of Pittsburgh Crucible Steel Co.

Proposed Protective Tariff on Manganese Ore 577

Statements Made to House Committee on Ways and Means Oppose Use of Domestic Ore

February Pig Iron Production 588

Month's Total 1,937,257 Tons—Daily Output 8750 Tons Less Than in January

American Steel Treaters' Convention..... 559
Labor Notes 566, 581, 582
Foreign Market Notes..... 568
Lathe Lead Screw Variator..... 569
Case Against Southern Pine Association.. 575
Railroad Rate Hearing..... 575
Strike Statistics 575
Opposition to the Use of Domestic Manganese Ore 577
Double Spindle Threading Machine..... 578
Pittsburgh Foundrymen's Meeting..... 578
Increased Charges in Iron Ore Shipments. 579
Valley Sheet Mills Resume..... 580
Comptroller Williams Complains of Corporation's Prices 580
International Association of Steel Manufacturers 582
Government Gets Reduced Prices..... 582
Editorials 584
The Right Buying Price—Class Legislation and Anarchy—Price Fluctuations in Dull Times—Motion Pictures Inside a Furnace
Correspondence 586
A Letter to Employees—Causes and Remedies of Depression
German Markets Show Signs of Weakness. 603
Industrial Finance 608
Will Resume Payments to the Railroads.. 608
Patent Laws in Congress..... 608

Iron and Steel Markets.....590
Comparison of Prices.....591
Prices Finished Iron and Steel, f.o.b. Pittsburgh.....604
Non-Ferrous Metal Markets.....605
Personal Notes.....606
Obituary Notes.....607
Machinery Markets and News of the Works.....609
New York Jobbers' Prices.....616

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The Right Buying Price

What prices are now in relation to what they were before the war seems likely to have a much more direct bearing on the return to business activity than the relation of prices to-day to those of the abnormal levels of the war or of last year. Much that is being talked about to-day with the underlying motive of attempting to build up confidence is devoted to the collapse from the high peaks. More and more will it become necessary to refer instead to the approach to pre-war conditions.

No need appears for reiterating the contention that pre-war prices are not to be expected. All through the war it was pointed out how one result would be a new scale of living for the world; that what were the luxuries to the masses had become the necessities, and that all the readjustment might effect was the eschewing of luxuries inadvisedly taken up by many who should not have done so. A difficulty has always existed in attempting to give a quantitative measure of what the new base must be. All that is definite is that it must be the foundation for further normal progress. The pessimist would hold that Europe shows that the sum total of the war has been a setting back of the mark to a point below the pre-war standard, but the great majority cannot conceive of general price levels for the next cycle very close to the old scales.

There is no authoritative medium by which the buyer can definitely assure himself when prices are right, and he will have to proceed as he always has done when he can see nothing further that is likely to enure to his advantage by withholding purchases. Time was in the years before the war when wise buyers felt justified periodically in buying freely, sensing a growing demand on the one hand and seeing nothing definite to be gained by postponement. They have admitted slight recessions in market prices after their making commitments, but these they expected and they had the advantage of being protected on the order books of suppliers when the rush for bookings following has, as always, made late comers suffer from belated deliveries.

There are buyers now who are trying to decide what is the safe buying level. They are beginning to show active interest, not so much because prices may be down such and such a per cent from the top, but because such prices apparently discount lower than present costs. It may be a factor of influence to note that prices of heavy rolled products, for example, were, according to the prices of THE IRON AGE of Feb. 24, nearly 42 per cent down from the levels of the spring of 1920, but it is a more understandable index to say that these same prices are only 43 per cent above the average of ten years before the war.

One way in which the recession factor does carry some weight is in the comparisons that against the 42 per cent drop in steel prices, the cost of living factor has dropped but 14 per cent and wages in some cases not at all, in others 20 per cent and in one or two extreme instances 30 per cent. The fact of steel and iron prices discounting costs is pointed out in the matter of transportation, which is still at war level costs and which, owing to the cumbersomeness of Government regulation, is likely to yield but slowly to the pressure for readjustment. In fact there has now been added the almost incredible case of an advance in ore carrying and handling charges by Michigan and Wisconsin railroads, for the Interstate Commerce Commission has permitted higher rates to be effective despite the protest of the ore producers. Signs are multiplying that public sentiment is rapidly swelling to overwhelming proportions to demand that no element of the business fabric stand in opposition to the completion of readjustment, whether Government department, private enterprise or labor. Recessions in all lines are asked and with as much haste as is possible consistent with a thorough job and the need for time for rekindling business confidence.

Besides wages in the building trades needing to come down to help in the revival of building operations, it seems clear that a decided recession is still due in several forms of building material. Among the numerous comparisons of commodity prices now and at various other periods—comparisons difficult to verify because of the uncertainty of the authorities used—brick, cement and lumber appear to be particularly out of line. A table compiled by J. S. Bache & Co., New York, covering the prices on Feb. 1 for all the years since 1914

shows that the prices of brick, cement and lumber on Feb. 1, this year, were 164, 217 and 122 per cent above the average of the prices on Feb. 1 for each of the five years before the war, that is, from 1910 to 1914, both inclusive. The major forms of rolled steel on the same basis, according to quotations of THE IRON AGE, were 74 per cent above the five-year Feb. 1 average before the war. In the past month sharp cuts have, of course, been made in steel prices, and prices at the end of February were not more than 50 per cent above the pre-war Feb. 1 average.

Class Legislation and Anarchy

The new program of union labor agreed upon at the meeting in Washington last week of representatives of more than a hundred unions affiliated with the American Federation of Labor involves two distinct policies, one of opposition to the open-shop movement of manufacturers and in favor of new legislation or the repeal of certain existing laws. This part of the program is, we believe, to a large extent unwise for various reasons, particularly because it seeks to obtain consideration for one class of people as against another class. It would permit the carrying on of the secondary boycott recently declared illegal and unconstitutional by the Supreme Court of the United States, and would legalize other acts which it was unsuccessfully attempted to legalize by the passage of the Clayton act, which was intended to prevent companies from combining while permitting labor to do as it pleased.

In an able article in the February number of the *Atlantic Monthly*, George W. Alger, a New York attorney, shows the grave danger of conferring special privilege on any class. He asserts that at the very root of democracy lies the great principle of equality before the law. He adds:

"Its establishment has taken generations. It has required the shedding of blood, the wreck of feudalism, the pitiless destruction of a régime under which class and caste distinctions had grown and thriven, under which unjust privileges, hoary with age, had made certain classes rich and powerful and had sapped the vitality of others."

Mr. Alger quotes an announcement made in a Kansas newspaper that the Wheat Growers' Association of the United States, with a membership of 70,000, had issued a proclamation to all its members urging them to refrain from selling any wheat after 8 p. m., Oct. 25, until such time as the price of good wheat should be raised to $3 per bushel.

"If this announcement had been made by an association of steel manufacturers," says Mr. Alger, "urging the holding of structural steel for a rise of $3 a ton over the current price, with Judge Gary's name at the bottom of it, asking the co-operation of members of the Iron and Steel Institute, indictment would have followed in a week. The Sherman anti-trust act would instantly have been brought into operation."

It certainly is true that farmers are openly permitted to do what steel manufacturers would immediately be prevented from doing, and now labor announces that it proposes to fight for special privileges. Although such action is contrary to what we believe to be the public interest, there is nothing illegal about it, but the second part of the program agreed upon at Washington goes further and proposes open defiance of the decisions of the courts. The so-called bill of rights adopted at Washington declares that labor must refuse to recognize or abide by the terms of injunctions which seek to prohibit the doing of acts which the workers have a lawful and guaranteed right to do, or which seek to compel workers to do those things which they have a lawful and guaranteed right to refuse to do.

"This is the only immediate course," it is declared, "through which labor can find relief and this course it proposes to pursue. Labor realizes fully the consequences of such a course, but in the defense of American freedom and of American institutions it is compelled to adopt the course, be the consequences what they may."

In other words, labor leaders propose to decide what the rights of labor are, and if that decision conflicts with the decisions of the courts of the United States, including the Supreme Court, the unions will resist, just as Samuel Gompers has advised the resistance of decisions in past years. This is radicalism run mad, and the leaders who advocate such a course have no right to talk as they did at Washington about the "insidious propaganda of radical European fanaticism." There is a difference in degree only between the two; both are anarchistic. The new Congress will do well not to make the slightest concession to the labor agitators who advocate pernicious class legislation and at the same time defy the courts.

Price Fluctuations in Dull Times

With the extensive decline that has occurred in pig iron prices in the past six months and the sharply declining tendency that has been exhibited by some finished steel products, the price fluctuating tendencies in a period of market dullness become a subject of interest. The notion entertained by many that in a dull period prices are wont to decline steadily and continuously is not well supported by precedent. There are numerous cases in iron and steel market history of prices advancing when demand was light and consumption well below the productive capacity.

It is true that if there is a prolonged industrial depression the general swing in prices is downward throughout, the lowest prices being frequently made as demand tends to revive. That is due to the influence of a general rule that production costs decrease. There are other factors, however, that make market prices besides the cost of production and the urgency or lack of urgency on the part of the buyer. These other influences produce short period fluctuations. The forces are somewhat complicated. Certain advances occur because previous declines had gone too far.

Two principal causes can be traced in iron and steel market history for prices declining too far and necessitating a rebound. One is the need at certain times for manufacturers to keep their plants in operation to preserve their credit, sales being made at a recognized loss in order to secure

a continuance of banking or other accommodations. Such an influence is certain to be lacking this year, as manufacturers have financial reserves. The other cause of goods being sold at a loss is that of producers over-rating their ability to reduce costs. They accept orders at prices below their known cost in anticipation of reducing costs while they operate, but find eventually they cannot reduce costs as much as they expected.

In either case prices have rebounded, not because the situation has grown stronger but because the previous decline had been overdone. The industrial depression in the eighteen-nineties, being so long, presented many illustrations of these principles. Industrially, the whole year 1894 was a bad year, yet there were many price rebounds in the year, in pig iron, billets and finished iron and steel products. The price decline following the panic of June, 1893, had gone too far.

Another influence, particularly in pig iron, brings about price advances at times when there is no widespread improvement in conditions generally, that influence being, in the case of pig iron, that when a furnace is blown out the expense involved in resumption is such that it is not incurred unless there is great promise of continued activity. A relatively small increase in demand may send the price up sharply, there being few furnaces actually seeking business.

The iron and steel market has moved in long swings in such spectacular manner that the minor fluctuations are apt to be forgotten, and at a time like this it is well to call attention to this fluctuating tendency. Even in a short period of inactivity, there are fluctuations. In the depression that extended from late in 1903 to late in 1904, there were several starts toward market activity, with advancing prices, before the start resulting in permanent improvement began. In much the same manner periods of activity and market strength have had their weak spells. The revival that occurred late in 1904 ushered in a period of three years of unbroken activity and strength, yet toward the middle of 1905 there was a marked recession in pig iron prices. Again, while in the retrospect the war period seems to have been one of unbroken activity and strengthening in prices, it is a fact that in June and July, 1916, prices showed distinct signs of being about to weaken.

Motion Pictures Inside a Furnace

The motion picture has been applied to another field of usefulness in metallurgy. In 1918 before the annual meeting of the American Society for Testing Materials at Atlantic City, a motion picture which was a vivid representation of the progressive flaws and cracks which develop in a piece of iron when it is gradually being broken under repeated stress was hailed as a development having unusual possibilities. At the February meeting of the Mining and Metallurgical Engineers in New York, a still more impressive triumph of the cinema camera was shown for the first time.

In the course of a presentation of the various steps in the manufacture of ingot iron, the actual melting down and boiling of the metal in the bath of a 100-ton open-hearth furnace was shown by projected motion pictures. It was probably the closest view which the human eye has yet had of this process. A water-jacketed camera was placed inside the furnace and the operator, who stood just outside the door, was clothed in an asbestos suit.

While no unusual phenomena not already known were revealed, the possibilities are easily imagined. The United States Bureau of Standards is responsible for this film and others of a like nature. The pictures are intended chiefly for educational purposes for use all over the country. In the latest case all the important steps in the making and rolling of sheets of iron are in some details perhaps more clearly shown than by an actual visit to the mills. The bureau is to be highly commended on its picture taking campaign and it is not too much to hope that knowledge may be obtained of a value not now apprehended.

CORRESPONDENCE

A Letter to Employees

To the Editor: The attached letter has just been received at this office written by George T. Meyer, vice-president. It is such a strong letter, so well thought out and hits the nail squarely on the head, we thought you would be interested.

M. R. PORTER,
President Pennsylvania Hardware & Paint Co.
New York, Feb. 23.

To the Employees of the Pennsylvania Hardware & Paint Co.

Mr. M. R. Porter.

A readjustment of labor and business conditions is at hand, business is slowing down in every line and there are now more applicants than jobs. Mills and factories are closing, to reopen when their employees agree to come back at a reduction in wages averaging 30 per cent. The automobile and tire industries are in a bad way; thousands of men formerly employed by these industries are trying to get into other lines. The question of a general reduction in salaries has been brought up by the directors of this company. Therefore this letter.

Of our own accord, the Pennsylvania Hardware & Paint Co. will never reduce a salary. Whether we will reduce salaries or not depends entirely on you. (This means everybody from the driver to the president.)

Our payroll for the entire business is very large. If our business continues to slow up and the profits drop, a 10 to 25 per cent reduction in this payroll would save the company a lot of money.

But there is a better and far more satisfactory way to meet the present business conditions than by reducing salaries and that way is up to you.

Avoid waste; use the utmost economy and efficiency in the performance of your particular duty. These few words hold a multitude of meaning, and if you will only apply them in your work they will produce some astonishing results.

We believe we have a good organization and if everyone will only bend himself to practice the utmost economy and efficiency in his work, the question of salary reduction will never come up.

If you will only use your head and not let the customers get away without being waited upon, or get away without getting the things they came after, you will help.

If you turn out an unnecessary light when you have finished with it, you will help.

If you watch the parts of an article that you are showing or that you are handling, so that some of

them are not lost and the main part of the article will need to be thrown away as junk, you will help. That box of cabinet locks back in the store is a horrible example of what I mean. When we took stock, we found dozens of locks and latches without parts, flash lights broken and other goods the same way. They all cost money and are a dead loss to us when they are so handled. By giving this your attention you will help.

If you open a packing case with the nail puller and put the lid back on, we can sell it; if you break it up and throw it out, we have a dead loss.

If you clerks would remember that the customers come in the front door and expect your immediate attention, I think it would help a lot. I know that all of you are willing, but am afraid your minds are too often occupied with something less important than the customer. Remember always the customers must have the first attention and you will be helping.

For the last few years business has been going along nicely, profits have been easy to make and salaries have been high; but there is not a doubt in the world that if you want to keep up your present rate of compensation, you will have to do your part to banish waste, indifference and neglect.

You can do it easily if you only try. AND YOU WILL HAVE TO DO IT if you want to stay with the Pennsylvania Hardware & Paint Co.

The past few years any kind of a worker could get a job; no matter how incompetent, how indifferent or how lazy he or she was. Now things have changed. Only those worth while will be able to hold their positions. That means in this store or any other place.

We are not going to stand for the indifference shown by some of you heretofore. For instance, how have you acted toward our suggestions regarding the weekly meetings; think this over.

We are going to demand better service for what we pay you. This notice will be received by those who have their own interest and the interest of the firm at heart, with anticipation. If there are one or two who cannot get the spirit of co-operation into their systems, they had better get off the ship at once, because we will have no use for them. Every one of us must get back to the good old idea of giving the best service we can, instead of getting all we can and giving as little as we can.

Five years ago men made from $15 to $25 per week; girls made $6 to $8 a week. Do you want to get back to those days? No; neither do we, and it is up to us to see that we do not.

This firm has every merchandising advantage that it is possible to have. Financially strong, we buy to the best advantage. Our warehouse connections are fine and our delivery system is good, so it is up to us to make money in our selling department and to save money on the small things we have been overlooking.

Keep this letter, read it occasionally, give it your best thought, and if you will act on the suggestions contained in it, we are sure that everything will be satisfactory and we trust you will act accordingly.

PENNSYLVANIA HARDWARE & PAINT CO.,
Geo. T. Meyer.

Causes and Remedies of Depression

To the Editor: The world is passing through a general readjustment as a result of the unbalance of the economic and social conditions largely created by the war. It seems strange that the United States of America, with its enormous natural resources and wonderful industrial developments, is afflicted by this critical depression, in spite of the fact that the hostilities with their wanton wholesale destruction were in Europe and on the sea.

The study of the causes of this abnormal state of affairs seems not only timely, but may also yield remedies, as knowledge always fathers progress.

In America production is the slogan of industry and production has been the keynote sounded by all advisers before, during and after the war; mass production has become the mental attitude of every manufacturer toward his products. This idea implied two corollaries: First, that the cost of producing is reduced in proportion to the number of the product, and second, that the profit will be great, as a small percentage per unit will be multiplied by a large multiplier, giving a handsome final result. This principle has been applied to steel plants as well as motor car factories or the talking machine industries, and it meant concentration of production in huge agglomerations such as Gary, Detroit, etc.

The main reason of the present market depression is the wrong application of the mass production idea; this principle has not only been considerably overestimated in its effect on production cost, as beyond a certain limit no appreciable savings can be obtained, but this principle has also totally disregarded the distribution of the product and the market of the product. Distribution is intimately linked with transportation and railroad policies and tariff questions, which may cut off complete districts, as manufacturers dealing with Canada or even California realized very soon. Market means the commercial end and includes credit agencies and above all the buying capacity of the territory. This last factor is a great variable that cannot be put in a formula and that often is in contradiction with mass production idea of so-much-a-day. For instance: Assuming sound resources, the production of a given number of motor cars or quantity of ammunition is a comparatively simple engineering problem of co-ordination and of finding the producing machinery, but to sell ammunition war is badly needed, as it gives the only possible chance to dispose of them, and to sell automobiles requires a rich country with cheap gasoline. Ammunition making stopped suddenly after the armistice and mass production of motor cars utterly failed in Europe after the armistice in spite of a gallant attempt of the manufacturers, and even here in America the motor car makers overtaxed the absorption capacity of their own market. There is such a thing as a tired market or a saturated market and a sick market; the present economic conditions prove it conclusively, and every industry should draw the wholesome conclusion that over-expansion is worse than strong financial reserves, in spite of the horrors of taxation or the mirage of huge possible profits on paper.

The principle of mass production is not always compatible with quality of the product or with the idea of service first, and it must not be forgotten that the satisfaction of the customer is often independent of the price paid.

The second principal reason of the present depression is speculation, or in other words, profiteering. The war dislocated the channels of trade, and production disrupted the balanced evolution existing in 1914 and created new conditions which were met by currency inflation, higher taxation and mortgages on the future (loans). During the period of uncertainties and development, speculation ran wild especially in the productive industries covered by the smokescreen of patriotic necessity. A seller's market developed that disregarded everything but immediate profits. At the turn of the tide the buyers answered by their only weapon—cancellation, and the public decided to wait and went on strike.

At the basis of the crisis is a lack of faith and the absence of business ethics which form the foundation of everything in life. The confidence of market can only be restored by sound principles and a square deal.

JOSEPH F. SHADGEN.
New York.

The Iron Age and Its Readers

The latest manifestation of desire of manufacturers to improve industrial conditions is due to the publication in THE IRON AGE of Feb. 3 of a summary of the recent survey of Cleveland industries. The survey was made under the supervision of the committee on labor relations of the Chamber of Commerce. Almost immediately after the Feb. 3 number appeared, the chamber received over 100 requests, coming from manufacturers all over the country. Many of them mentioned specifically having seen the summary in THE IRON AGE.

PIG IRON OUTPUT LOWER

February Daily Rate 8758 Tons Less Than in January

Net Loss of Thirty Furnaces—Smallest February Output in Several Years

The uninterrupted decline of the last few months in the production of pig iron by the blast furnaces of the country was decidedly increased in February. The production last month was the lowest for any February in the last five years and the month's production was lower than that for any month since October, 1919, at the time of the steel strike. The net loss in furnaces blown out or banked was 30, bringing the total net loss for the last five months to 166.

The production of coke and anthracite furnaces in February, a 28-day month, amounted to 1,937,257 gross tons, or an average of 69,187 tons per day, as compared with 2,416,292 tons, or an average of 77,945 tons per day, according to the revised statistics, in January, a 31-day month, and with 2,703,855 tons, or 87,222 tons per day in December, a 31-day month. The contrast is emphasized by the data for February, 1920, when the total output was 2,978,879 tons, or 102,720 tons a day. The February output this year shows a decline from that of January of 479,045 tons, or 8758 tons a day. There was a net loss of 30 furnaces, the total in blast on March 1 having been 153, as compared with 183 on Feb. 1 and 201 on Jan. 1. There were 37 furnaces blown out and 7 blown in during the month. No one of those blown in was credited to the Steel Corporation. Of those blown out 16 were those of the leading interest.

The ferromanganese production last month was 17,447 gross tons as compared with 19,686 tons in January. The spiegeleisen output was 11,566 tons last month as compared with 2542 tons in January.

Daily Rate of Production

The daily rate of production of coke and anthracite pig iron by months, from February, 1920, is as follows:

Daily Rate of Pig Iron Production by Months—Gross Tons

	Steel Works	Merchant	Total
February	75,230	27,490	102,720
March	80,021	28,879	108,900
April	65,168	26,159	91,327
May	68,668	27,644	96,312
June	73,659	27,792	101,451
July	71,954	26,983	98,937
August	72,740	28,789	101,529
September	74,908	29,402	104,310
October	77,214	28,998	106,212
November	71,669	26,161	97,830
December	66,037	20,185	87,222
January, 1921	62,327	15,618	77,945
February	58,060	11,127	69,187

The figures for daily average production, beginning with January, 1915, are as follows:

Daily Average Production of Coke and Anthracite Pig Iron in the United States by Months Since Jan. 1, 1915 —Gross Tons

	1915	1916	1917	1918	1919	1920	1921
Jan.	51,659	102,746	101,643	77,799	106,525	97,264	77,945
Feb.	59,813	106,456	94,473	82,835	105,006	102,720	69,187
Mar.	66,575	107,667	104,882	103,648	99,685	108,900	.....
Apr.	70,550	107,592	111,165	109,607	82,607	91,327	.....
May	73,015	108,422	110,238	111,175	68,002	96,312	.....
June	79,361	107,053	109,002	110,793	70,495	101,451	.....
July	82,691	104,017	107,820	110,354	78,340	98,931	.....
Aug.	89,666	103,346	104,772	109,341	88,496	101,529	.....
Sept.	95,085	106,745	104,465	113,942	82,932	104,310	.....
Oct.	100,822	113,189	106,550	112,482	60,115	106,212	.....
Nov.	101,244	110,394	106,859	111,802	79,745	97,830	.....
Dec.	103,333	102,537	92,997	110,762	84,944	87,222	.....

Among the furnaces blown in was one Steelton furnace of the Bethlehem Steel Co. in the lower Susquehanna Valley; No. 1 Monesson furnace of the Pittsburgh Steel Co. in the Pittsburgh district; two Johnstown furnaces of the Cambria Steel Co. in western Pennsylvania; one Iroquois furnace of the Steel & Tube Co. of America in Illinois, and the new furnace of the St. Louis Coke & Chemical Co. of Granite City, in the same State, and the Missouri furnace in Missouri, and No. 6 Ensley furnace of the Tennessee Coal, Iron & Railroad Co. in Alabama.

Among the furnaces blown out or banked were the Buffalo furnaces B and C and the Harriet furnace Y in the Buffalo district; one Hokendauqua furnace of the Thomas Iron Co., in the Lehigh Valley; No. 6 Carrie furnace, No. 1 Duquesne furnace, one Edgar Thomson and one Lucy furnace of the Carnegie Steel Co. and two furnaces of the Jones & Laughlin Steel Co. in the Pittsburgh district; No. 2 New Castle furnace and No. 1 Farrell furnace of the Carnegie Steel Co. in the Shenango Valley; the Adrian and Punxy furnaces in western Pennsylvania; No. 2 La Belle furnace and the Top Mill and Weirton furnaces in the Wheeling district; No. 2 Ohio furnace of the Carnegie Steel Co., B furnace of the Youngstown Sheet & Tube Co., two Haselton furnaces of the Republic Iron & Steel Co. and the McKeefrey furnace in the Mahoning Valley; the Newburgh furnace of the American Steel & Wire Co., the Franklin and Steelton furnaces of the Carnegie Steel Co., the two furnaces of the Otis Steel Co., one River furnace and the Upson furnace in Central and Northern Ohio; two new South Chicago furnaces and one Joliet furnace of the Illinois Steel Co. in Illinois, and two Gary furnaces in Indiana; one No. 3 Bessemer furnace of the Tennessee Coal & Iron Co. and one furnace of the Woodward Iron Co. in Alabama, and the remaining Rockwood furnace in Tennessee.

Production of Steel Companies—Gross Tons

Returns from all furnaces of the United States Steel Corporation and the various independent steel companies, as well as from merchant furnaces producing ferromanganese and spiegeleisen, show the following totals of steel making iron, month by month, together with ferromanganese and spiegeleisen. These last, while stated separately, are also included in the columns of "total production."

Production of Steel Companies—Gross Tons

	Total Production			Spiegeleisen and Ferromanganese		
	1919	1920	1921	1919	1920	1921
Jan.	2,430,022	2,232,455	1,932,159	32,787	23,957	22,228
Feb.	2,209,470	2,181,679	1,625,695	28,105	28,038	29,013
Mar.	2,277,507	2,486,668	.....	26,644	35,275	.....
Apr.	1,838,677	1,968,542	.....	17,308	27,628	.....
May	1,586,805	2,128,720	.....	14,604	33,407	.....
June	1,655,944	2,209,770	.....	14,254	34,751	.....
July	1,906,604	2,230,567	.....	14,805	36,789	.....
Aug.	2,108,566	2,254,943	.....	17,419	36,985	.....
Sept.	1,828,613	2,247,250	.....	20,631	39,546	.....
Oct.	1,295,690	2,393,644	.....	20,238	34,786	.....
Nov.	1,727,656	2,150,075	.....	19,964	26,944	.....
Dec.	1,916,249	2,047,167	.....	15,718	28,023	.....

Output by Districts

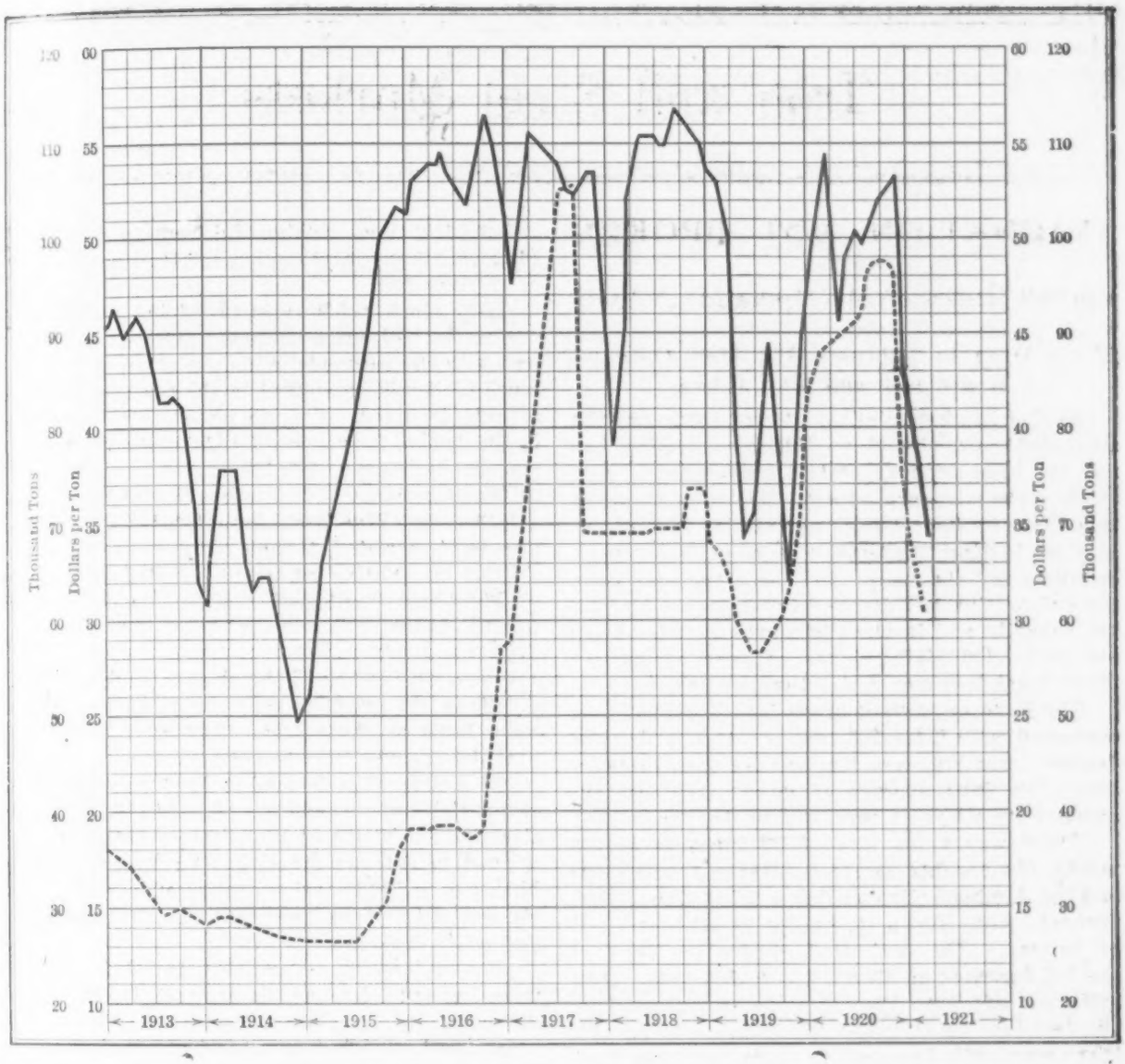
The accompanying table gives the production of all coke and anthracite furnaces for February, and the three months preceding:

Pig Iron Production by Districts, Gross Tons

	Feb. (28 days)	Jan. (31 days)	Dec. (31 days)	Nov. (30 days)
New York	99,019	141,661	183,169	213,895
New Jersey	3,858	3,071	6,207	9,418
Lehigh Valley	45,281	62,306	78,243	83,539
Schuylkill Valley	26,677	30,928	46,124	82,002
Lower Susquehanna and Lebanon Valleys	26,911	30,762	43,845	66,535
Pittsburgh district	486,669	557,350	571,378	587,073
Shenango Valley	83,064	100,795	107,933	111,211
Western Penna.	76,697	69,701	90,681	110,240
Maryland, Virginia and Kentucky	23,165	26,485	50,304	97,151
Wheeling district	93,477	123,222	136,967	136,589
Mahoning Valley	177,411	279,950	303,211	293,353
Central and Northern Ohio	166,571	247,389	283,446	290,224
Southern Ohio	12,200	27,962	39,986	53,057
Chicago district	406,222	464,875	471,455	484,841
Mich., Minn., Mo., Wis., Colo., and Wash.	81,812	99,514	128,351	135,956
Alabama	124,513	143,997	153,460	169,760
Tennessee	3,710	6,324	9,095	10,064
Total	1,937,257	2,416,292	2,703,855	2,934,908

Diagram of Pig Iron Production and Prices

The fluctuations in pig iron production from 1913 to the present time are shown in the accompanying chart. The figures represented by the heavy line are those of daily average production by months of coke and anthracite iron. The dotted curve on the chart represents monthly average prices of Southern No. 2 foundry pig iron at Cincinnati, local No. 2 foundry iron at furnace at Chicago, and No. 2X at Philadelphia. They are based on the weekly quotations of THE IRON AGE.



The Full Line Represents the Daily Production of Pig Iron and the Dotted Line Is the Average of the Price Per Ton of No. 2 Southern Pig Iron at Cincinnati, Local No. 2 Iron at Chicago and No. 2X Iron at Philadelphia

Production of Coke and Anthracite Pig Iron in the United States by Months, Beginning Jan. 1, 1916—Gross Tons

	1917	1918	1919	1920	1921
Jan.	3,150,938	2,411,768	3,302,260	3,015,181	2,416,292
Feb.	2,645,247	2,319,299	2,940,168	2,978,879	1,937,257
Mar.	3,251,352	3,213,091	3,090,243	3,375,907	.....
Apr.	3,334,960	3,288,211	2,478,218	2,739,797	.....
May	3,417,340	3,446,412	2,108,056	2,985,682	.....
June	3,270,055	3,323,791	2,114,863	3,043,540	.....
July	3,342,438	3,420,988	2,428,541	3,067,043	.....
Aug.	3,247,947	3,389,585	2,743,388	3,147,402	.....
Sept.	3,133,954	3,418,270	2,487,965	3,129,323	.....
Oct.	3,303,038	3,486,941	1,863,558	3,292,597	.....
Nov.	3,205,794	3,354,074	2,392,350	2,934,908	.....
Dec.	2,882,918	3,433,617	2,633,268	2,703,855	.....
Total, yr.*	38,185,981	38,506,047	30,582,878	36,414,114	.....

*These totals do not include charcoal pig iron. The 1919 production of this iron was 327,097 tons.

Good Furnace Performance

The new blast furnace of the St. Louis Coke & Chemical Co. at Granite City, Ill., which blew in on Feb. 8, produced 7304 tons of foundry and malleable pig iron during the remainder of the month, averaging 475 tons a day toward the close of the period. The furnace is now on basic, having worked down to that grade in three weeks' time. Only two off sulphur casts were obtained during the month. Roberts by-product coke has been used exclusively. At first this coke was made from a coal mixture containing 15 per cent Pocahontas, but this proportion has been reduced to 10 per cent and in another week it is expected to eliminate it altogether, using Illinois and Indiana coal only. At present the furnace is consuming an average of 1900 pounds of coke per ton of pig iron produced.

Puddlers' Wages Reduced

YOUNGSTOWN, OHIO, March 1.—The boiling rate will decline to $15.02 for the March-April period, from $18.52, the rate which prevailed in January and February, as a result of the bi-monthly examination of sales sheets conducted Feb. 28 at Youngstown between representatives of the Western Bar Iron Association and the Amalgamated Association of Iron, Steel and Tin Workers.

The examination disclosed an average selling price of 2.80c. per lb. on shipments of bar iron during the 60-day period from Dec. 20 to Feb. 20, as compared with 3.50c. two months ago.

This decline does not fully represent the drop in bar iron prices, however, inasmuch as certain important producing interests have been selling under 2.80c. for some time.

Puddlers' wages reached a peak of $18.76 in the last bi-monthly period of 1920. The prevailing rate is still far above that for normal times before the war.

The annual exhibition of evening work at Pratt Institute, Brooklyn, will be held on the evening of March 10. Special efforts are being made to offer courses that will be of practical value to men temporarily out of employment. Instruction is given, among other things, in industrial electricity, technical chemistry, mechanical drawing and machine design, stationary steam engineering, internal combustion engine work, machine shop, tool making and forge work, foundry practice, etc.

Iron and Steel Markets

STAGNATION NOT BROKEN

Further Recession in Corporation Activity

Sharp Drop in February Pig Iron Output—Lower Iron and Steel Prices

Buying has been limited to bare needs and the stagnation resulting from the price cutting has not yet been broken. While independents generally appear to have booked sufficiently to maintain their recent scale of operations, further recessions in Steel Corporation plant activities more definitely tell the story. In the Chicago territory the corporation has dropped to 60 per cent of ingot capacity and in the Pittsburgh district to 65 per cent. On March 1 the corporation had 15 fewer blast furnaces active than on Feb. 1.

The February output of pig iron, 1,937,257 tons compared with 2,416,292 tons for the 31 days of January, was 8758 tons less per day than in January. The daily average of 69,187 tons was the smallest for six years save for two months in 1919.

There was a net loss of 30 furnaces in the month, the number active on March 1 being 153 and the number active on Feb. 1 being 183. Seven furnaces were blown in, but 37 in all blown out or banked. The estimated production rate of the 153 furnaces on March 1 is 61,850 tons. How sweeping has been the recession is indicated by the fact that on Oct. 1, 1920, or five months ago, there were 319 furnaces in blast, or more than twice the number now operating. February marks the first month in some time in which the Steel Corporation has not been increasing its pig iron production.

New low prices have been established in both pig iron and steel, but the fewness of transactions and the special considerations surrounding them make it impossible to recognize all the minimum quotations commonly bandied about. In steel bars and sheets competition for business is notably strong but steel bars remain at 2c., Pittsburgh, while tank plates and beams have been reduced $1 per ton, or to 2.10c. Yet 3000 tons of plates have been sold for March delivery at the 2.65c. basis. Black sheets are now 4c. and galvanized, 5.25c., and in the face of these prices one mill has booked a large order of the former at 4.20c.

Southern pig iron has receded another dollar to $26.50, Birmingham, and on Northern iron concessions are freely made even when the tonnages sold are not large. Reports of sales of Buffalo and eastern Pennsylvania irons in New England indicate prices several dollars lower and in general the condition of the pig iron market is one of decided weakness, the only encouraging feature being that in some sections there is a slight increase in the activity of foundries.

Two leading makers have reduced wrought iron pipe $8 and $9 a ton. Not over 40 per cent of the independent pipe making furnaces in the Valley districts are in operation, but the National Tube Co. is running full.

How much fresh railroad buying will develop out of the legislation releasing Government money owing to the railroads is not yet clear, seeing that much of it will be applied to the payment of debts already incurred. For tie plates three roads are in the market for a total of 12,000 tons and there is activity in 500 and 1000 keg lots of track bolts and spikes. Except for 6000 tons of rails for the Alaskan Engineering Commission, no fresh rail tonnages of size have appeared, though more pressure for deliveries on existing contracts is noted in Chicago.

Municipal buying of cast iron pipe has improved. About 7000 tons has been closed and about 3000 tons is now active.

Bar iron is weak in the absence of demand, but a drop in the puddling scale from $18.52 to $15.02 on a basis of the regular bi-monthly adjustment provides one way for meeting the market conditions.

At a time when demand is developing for a general revision of railroad freight rates, the incredible situation has arisen of higher ore carrying charges allowed to carriers from the Old Range mines in Michigan and Wisconsin, an item adding further to the problems of readjustment of those companies ordinarily dependent on this ore.

The betterment in inquiries for fabricated steel work has spread to all the important centers, and numbers of projects averaging 200 or 300 tons have been closed. A brightening is noted in demand for tanks for the oil regions.

One of the lines active by comparison is light rails. As low as 2.25c., Pittsburgh, has been done.

Further recessions have occurred in the British market, where buying seems to be only for urgent needs and is frequently satisfied by purchases of Continental material. German billets have sold at $32 against the British price of $52. Welsh tin plate has dropped to $5.25 per box, but lines of finished material not entering largely into international competition are considerably higher than like American products.

Pittsburgh

PITTSBURGH, March 1.

While the past week has developed some increases in the active independent steel capacity, notably in tin plate, and to a less extent in sheets, this must be said to be the result of an accumulation of orders rather than an enlargement of the interest of buyers in the market. In a broad way it still must be said that the effect of the cut in prices by independent companies has not been to bring them business but rather to bring suspensions of orders to the Steel Corporation subsidiaries. All of the latter, with the sole exception of the National Tube Co., are running on a much lower scale than recently, and while the tubular goods subsidiary still is running full, it is no secret that its new obligations are running far short of matching those which are completed. Independent pipe making capacity is less fully engaged than before in almost two years. The Midvale Steel & Ordnance Co. is

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Mar. 1, 1921	Feb. 22, 1921	Feb. 1, 1921	Mar. 2, 1920
No. 2X, Philadelphia‡	*$28.34*	$30.09	$32.09	$45.35
No. 2, Valley furnace†	*26.50*	27.00	29.00	41.00
No. 2 Southern, Cin'ti†	*31.00*	32.00	34.50	43.60
No. 2, Birmingham, Ala.†	*26.50*	27.50	30.00	40.00
No. 2 foundry, Chicago*	*27.00*	28.00	30.00	43.00
Basic, del'd, eastern Pa.	*27.26*	28.40	31.40	43.40
Basic, Valley furnace	25.00	25.00	30.00	41.50
Bessemer, Pittsburgh	28.96	28.96	33.96	43.40
Malleable, Chicago*	*26.50*	28.50	30.50	43.00
Malleable, Valley	27.00	27.00	30.00	42.00
Gray forge, Pittsburgh	*27.46*	27.96	29.96	42.40
L. S. charcoal, Chicago	38.50	38.50	40.50	57.50
Ferromanganese, Atl. port	90.00	90.00	90.00	200.00
Rails, Billets, Etc., Per Gross Ton:				
Bess. rails, heavy, at mill	$45.00	$45.00	$45.00	$45.00
O.-h. rails, heavy, at mill	47.00	47.00	47.00	47.00
Bess. billets, Pittsburgh	38.50	38.50	43.50	60.00
O.-h. billets, Pittsburgh	38.50	38.50	43.50	60.00
O.-h. sheet bars, P'gh	42.00	42.00	47.00	65.00
Forging billets, base, P'gh.	43.50	43.50	48.50	80.00
O.-h. billets, Phila	49.24	49.24	49.24	64.10
Wire rods, Pittsburgh	52.00	52.00	57.00	70.00
Finished Iron and Steel, Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	2.70	2.70	2.70	4.25
Iron bars, Chicago	*2.60*	2.63	2.68	3.50
Steel bars, Pittsburgh	2.00	2.00	2.35	3.50
Steel bars, New York	2.38	2.38	2.73	3.77
Tank plates, Pittsburgh	*2.10*	2.15	2.50	3.50
Tank plates, New York	*2.48*	2.53	2.88	3.77
Beams, etc., Pittsburgh	*2.10*	2.15	2.45	3.00
Beams, etc., New York	*2.48*	2.53	2.83	3.27
Skelp, grooved steel, P'gh.	*2.35*	2.45	2.45	2.75
Skelp, sheared steel, P'gh.	*2.50*	2.65	2.65	3.00
Steel hoops, Pittsburgh	2.80	2.80	3.05	4.00

*The average switching charge for delivery to foundries in the Chicago district is 70c. per ton.
†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

The prices in the above table are for domestic delivery and do not necessarily apply to export business.

Sheets, Nails and Wire, Per Lb. to Large Buyers:	Mar. 1, 1921 Cents	Feb. 22, 1921 Cents	Feb. 1, 1921 Cents	Mar. 2, 1920 Cents
Sheets, black, No. 28, P'gh.	*4.00*	4.10	4.35	5.50
Sheets, galv., No. 28, P'gh.	*5.25*	5.35	5.70	7.00
Sheets, blue an'l'd, 9 & 10.	3.20	3.20	3.55	4.50
Wire nails, Pittsburgh	3.10	3.10	3.25	4.00
Plain wire, P'gh	3.00	3.00	3.25	3.50
Barbed wire, galv., P'gh.	3.85	3.85	4.10	4.45
Tin plate, 100-lb. box, P'gh.	$7.00	$7.00	$7.00	$7.00
Old Material, Per Gross Ton:				
Carwheels, Chicago	$19.00	$19.00	$22.00	$34.50
Carwheels, Philadelphia	*20.00*	23.00	25.00	42.50
Heavy steel scrap, P'gh	*15.00*	16.00	16.00	27.00
Heavy steel scrap, Phila.	*13.50*	14.50	14.50	25.50
Heavy steel scrap, Ch'go	*14.00*	14.50	15.50	23.50
No. 1 cast, Pittsburgh	22.00	22.00	23.00	34.00
No. 1 cast, Philadelphia	*22.00*	23.00	23.50	40.00
No. 1 cast, Ch'go (net ton)	*16.75*	17.50	18.50	37.50
No. 1 RR. wrot, Phila.	*18.00*	19.00	20.00	36.50
No. 1 RR. wrot, Ch'go (net)	13.00	13.00	14.00	26.00
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt	$4.50	$4.50	$4.50	$6.00
Furnace coke, future	5.75	5.75	6.00	6.00
Foundry coke, prompt	5.50	5.50	6.00	7.00
Foundry coke, future	*6.00*	6.50	6.50	7.00
Metals, Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	*13.00*	13.25	13.25	18.75
Electrolytic copper, N. Y.	*12.50*	12.75	12.75	18.75
Zinc, St. Louis	*4.75*	4.95	5.00	8.75
Zinc, New York	*5.10*	5.35	5.30	9.10
Lead, St. Louis	*3.90*	4.20	4.60	9.00
Lead, New York	*4.00*	4.40	4.85	9.25
Tin, New York	*30.00*	32.50	33.00	63.25
Antimony (Asiatic), N. Y.	5.20	5.20	5.25	11.87½

operating its Johnstown plant at about 40 per cent of capacity. Other independents do not appear to have fared nearly so well in the drive for business, and taking those companies located in the Valley district, Pittsburgh and Wheeling, it may be said that 20 per cent of capacity operations is a liberal estimate of what they are doing to-day. The Carnegie Steel Co., since a week ago to-day, has withdrawn the blast from four furnaces and now has 39 of its 59 stacks making iron. Its steel works operations are right around 65 per cent of capacity. The American Steel & Wire Co. is running less than 30 per cent, while the American Sheet & Tin Plate Co. is doing about 60 per cent in both sheet and tin plate mills. New business with the Steel Corporation constituents is not at all brisk, and since the independents, taking them as a whole, are not getting very many new orders, the assertion is safe that at no time since the buying subsided has new business been nearer the zero point. It is apparent that buyers are not interested so much in obtaining tonnages at the low prices which the independents are willing to accept as they are in getting rid of their high costing material. In spite of the oft repeated assertion of Judge Gary that the corporation contemplated no immediate reduction in prices or wages, the belief will not down that before long it will take definite action in this direction. This belief may possibly explain the lack of interest in the market even when what appear to be very low prices are quoted. The effect upon sentiment of the signing by the President of the Winslow bill making available for the railroads about $300,000,000 has been comparatively slight. It is admitted that the ultimate possibilities of this legislation are favorable, but the impression is rather general that it will take at least a month, and possibly longer, to cut the red tape in Washington and thus make the measure effective. A good many people see the melting of numerous frozen accounts, but it is pointed out that the validity of the railroad transportation act with regard to the Government payments to the railroads still has to be passed upon by the court, and the fact that steel prices plainly are tending downward will make the railroads cautious about buying heavily even when the funds are available.

Pig Iron.—It is doubtful whether the trade has ever before experienced a much quieter week than the one under review. Such inquiries as have come out have rarely involved more than 100 tons and these have not been at all numerous. Interest in steel making grades has been positively nil and 1000 tons probably covers the week's business in the foundry grade. We note one sale of No. 2 foundry iron from a western Pennsylvania furnace at $27 and a few carloads have been moved from Valley furnaces at the same price. However, there have been sales of foundry iron running 2.25 to 2.75 in silicon at $28, Valley furnace, which, allowing the usual differential of $1.25 per ton, would work back to $26.75 for the base grade, and one merchant furnace interest has taken a little tonnage at $26.50. On round tonnages the latter price now is considered to represent the maximum price possibilities on No. 2 foundry. W. D. Snyder & Co. averages for the month of February on sales of basic and Bessemer iron from Valley furnaces are $25 and $27 respectively, as compared with $30 and $32 in January. Sales upon which these averages are based are understood to have amounted to less than 10,000 tons. It is reported that the Ella furnace at West Middlesex, Pa.; the Mattie furnace at Girard, Ohio, and the stack of the Stewart Furnace Co. at Sharon, Pa., will be banked or blown out at an early date.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being $1.96 per gross ton:

Basic	$25.00
Bessemer	27.00
Gray forge	25.50
No. 2 foundry	26.50
No. 3 foundry	26.00
Malleable	27.00

Wire Rods.—The possibility of foreign competition now is engaging the attention of the trade because of a report of foreign offerings to Canadian consumers, at a price of somewhat less than $50 per gross ton, delivered. The American Steel & Wire Co. still is adhering to its former base of $57 Pittsburgh, for common soft rods, but all of the independents are willing to take business at $52 and that measures the maximum price possibilities of the present market, in view of the fact that demand has rarely been smaller than it is at present. Prices are given on page 604.

Plates.—The market appears to be quotable from 2c. to 2.65c., the Steel Corporation having made no change and reporting an order of about 3000 tons for March delivery, at regular quotation of 2.65c., the lower figure being what buyers report having been quoted them. Some independents would not to-day consider less than 2.15c., but buyers seem to think they would not have much trouble in obtaining round lots at 2c. flat.

We quote sheared plates of tank quality ¼ in. and heavier at 2c. to 2.65c., Pittsburgh.

Ferroalloys.—The market is easier on ferromanganese, but the reduction is in the price ideas of domestic consumers rather than the result of sales or of any increase in the demand. The market on 76 to 80 per cent material now can be quoted at $90 to $95 delivered, this range covering both resale tonnages and new production. Some of the English producers still are quoting $100 c.i.f. Atlantic seaboard, but with this quotation is the suggestion that firm offers of less would be considered. Business in spiegeleisen is stagnant and only an approximation may be made of prices. One important producer has a quotation of $40 furnace for either 16 to 19 per cent or 19 to 21 per cent alloy, but no sales have been made at this figure and in view of the fact that export business has been done at a price of less than $35 furnace, it is believed that domestic consumers would not have to go above that price to secure tonnages. The market shows little activity in 50 per cent ferrosilicon, which is being quoted by domestic producers at $93 to $95 furnace, freight allowed. Imported 50 per cent ferrosilicon is being offered at from $90 to $95, delivered Pittsburgh. Some very low prices are being named by makers of electrolytic ferrosilicon of the lower grades. An inquiry for some 12 to 13 per cent material brought out a quotation of $44 from a maker having a freight rate into the Pittsburgh district of $3.64. The same grade of material made in blast furnaces at Jackson, Ohio, would cost $58.56, delivered Pittsburgh. It is reported that the Steel Corporation has bought a tonnage of 50 per cent ferrosilicon but details as to the amount, deliveries and prices are not available. It also is reported to have bought a portion of its requirements of ferrochrome and to have bought domestic material. No details as to prices are made public, but it is stated that a quotation of 14½c. on foreign material, 6 to 8 per cent carbon, failed to get the business.

We quote 76 to 80 per cent ferromanganese at $90 to $95 delivered. This covering resale tonnages and new production of domestic makers; English material nominal at $100 c.i.f. Atlantic seaboard. We quote average 20 per cent spiegeleisen at $35 furnace, 50 per cent ferrosilicon $93 to $95 furnace, freight allowed, for domestic and $90 to $95 delivered for foreign material. Bessemer ferrosilicon is quoted f.o.b. Jackson County and New Straitsville, Ohio, furnaces, as follows: 9 per cent, $54.50; 10 per cent, $58; 11 per cent, $61.30; 12 per cent, $64.60. Silvery iron, 6 per cent, $40; 7 per cent, $41.50; 8 per cent, $43.50; 9 per cent, $45.50; 10 per cent, $48; 11 per cent, $51.30; 12 per cent, $54.50. The present freight rate from Jackson and New Straitsville, Ohio, into the Pittsburgh district is $4.06 per gross ton.

Structural Material.—Fabricating interests here generally report plenty of inquiries, but also considerable difficulty in getting buyers to close. The American Bridge Co. has taken 325 tons from the Louisville & Nashville Railway for a single track 212-ft. span bridge over the Barren River. This constitutes the only important award that has come out here recently, but the Pittsburgh-Des Moines Steel Co. is low bidder for 12 55,000-bbl. oil storage tanks for the use of the Shipping Board, to be set up in Norfolk, Va., and which will require about 2500 tons of steel. The Bell Telephone Co. of Pennsylvania has taken bids for a building to house an automatic exchange in East Liberty, Pa., which will take 250 tons of steel and which it is believed will soon be placed. Competition for structural contracts continues extremely sharp, and it is said some companies are forgetting overhead costs in the prices they are quoting. Quotations on plain material as low as 2c. are reported, and the market appears to be quotable on large structural beams from 2c. to 2.35c. Prices given on page 604.

Wire Products.—Business shows no improvement and prices are nominal and indefinite. In territory to the West and South, where Pittsburgh manufacturers are in competition with Ironton, Ohio, mills, a price of as low as $3, Pittsburgh, is reported to have been named on nails. The public quotation of the Pittsburgh district makers, however, is $3.25, and reports of price cutting which emanated in the West are vigorously denied. There is little sign yet of any agricultural demand for wire or fence. Plant operations in this district do not exceed 20 per cent.

We quote wire nails at $3.10 to $3.25 base per keg, Pittsburgh, and bright basic and Bessemer wire at $3 to $3.25 base per 100 lb., Pittsburgh.

Iron and Steel Pipe.—Effective March 1, the Reading Iron Co. has issued a new card of discounts on wrought iron pipe in which it has cancelled in some sizes about half of the increase it made last December. That advance carried prices up $16 to $18 per ton while the revision just announced makes a cut of $8 in butt-weld pipe in sizes from ½-in. to 1½-in. and of $9 in all sizes of lap-weld pipe, except in 2½-in., in which the cut is about $3 per ton. The new card brackets 2 to 2½-in. lap-weld at one price and 3-in. to 6-in. at one price. In the old card, 2-in. was quoted at one price and sizes from 2½-in. to 6-in were bracketed at one price. The company's price of ⅜-in. butt-weld pipe is advanced $2 per ton in the new card. The A. M. Byers Co. has met the revision by the Reading Iron Co. and both companies now are quoting the same discounts. The effect of the reduction has been to release some suspended tonnages and to prevent some cancellations which had come in. The A. M. Byers Co. has had most of its finishing capacity idle during the past week, but is starting its pipe furnaces in Pittsburgh this week. No change is noted in the market for steel pipe either as regards new demand or prices. The spring demand for merchant steel pipe has not yet appeared and inquiries for oil country goods reflect the less extensive drilling plans, due to the decline in crude oil prices. Steel pipe capacity is less fully engaged than it has been. At the end of last week, the Jones & Laughlin Steel Co. was operating four of its five furnaces, and Spang, Chalfant & Co. four of its seven furnaces. In the Youngstown district, the Youngstown Sheet & Tube Co. has four of eleven pipe furnaces running while the Republic Iron & Steel Co. is operating two of its six furnaces. LaBelle Iron Works has one furnace out of four in operation and this constitutes all of the active independent pipe capacity in the Wheeling district. This makes a total of 15 pipe furnaces in operation of a total of 38 independent furnaces in the districts mentioned, not quite 40 per cent, and the lowest point reached since the recession in business developed. The National Tube Co. reports full operation and the shipment of its entire production. It has been said that high operating rate of this company has been due to the fact that it has been consigning its product freely, but in refutation of this statement it is officially declared that of shipment during January amounting to not less than 120,000 tons there were invoices against about 100,000 tons. Discounts are given on page 604.

Iron and Steel Bars.—Business in steel bars remains at a low ebb, despite the willingness of some of the independent companies to go below 2c. to secure orders. The Steel Corporation continues to quote 2.35c., but the bar mills are least fully engaged of any of its finishing mills, and it is evident that it is not getting much new business. Only a few independent bar mills in this and nearby districts are running, and these sporadically, as orders accumulate. The lower puddling rate has enabled makers of iron bars to cut prices $5 per ton.

We quote steel bars rolled from billets at 1.95c. to 2.35c.; reinforced bars, rolled from billets, 2.25c. to 2.35c. base; refined iron bars, 3c., in carloads, f.o.b. mill, Pittsburgh.

Sheets.—Quotations as low as 4c. on black sheets and of 5.25c. on galvanized by independent companies

do not appear to be stimulating the demand to any considerable extent and independent mill operations are not greatly in excess of 20 per cent of capacity. This, too, despite the fact that in the Valley district and in Canton, Ohio, about 31 per cent of the independent mills are in operation this week, which is a fair sized gain over the recent rate. The leading interest is running about 60 per cent of capacity, but probably will not hold to this rate this week, as its new orders are few and small and low price by independents are bringing to it a good many suspensions. Prices are given on page 604.

Tin Plate.—The American Sheet & Tin Plate Co. is operating at about 60 per cent and still reports shipments to be about two-thirds of total production. Container manufacturers are specifying more freely and this has served to bring up activities of most of the independent plants. Follansbee Brothers Co., which has been operating on a part time schedule for the past few weeks, is running full this week, while the Weirton Steel Co. has all of its 26 mills at Weirton in operation. The McKeesport Tinplate Co. has sufficient business to maintain full operations at least for this week. Mills of the Wheeling Steel & Iron Co. and of the Jones & Laughlin Steel Co. are idle this week, but the latter will operate in part next week. There are no suggestions of business in production plate at less than $7 per base box.

Hoops and Bands.—Practically no market exists and quotations merely are a measure of what might possibly be done if there was any business. The Steel Corporation price still is 3.05c., but independent makers have expressed a willingness to accept tonnages which are desirable from a rolling mill standpoint as low as 2.80c. base.

Boiler Tubes.—Demands still are extremely small, as buyers are holding off in expectation of lower prices. The reduction just announced in iron pipe does not include iron boiler tubes, which dropped in price several weeks ago. Discounts are given on page 604.

Cold-Finished Steel Bars.—The market is quotable from 3.25c. to 3.60c. base, but both prices merely are quotations and find almost no basis in sales, which only rarely in the past have been so few and small as they are at present. It is not so much a question of prices with buyers as it is one of needs, and just now they do not need supplies.

Steel Rails.—Early release of the large amount owed the railroads by the Government is expected to enable the carriers to meet some of their old debts and to increase their specifications against their orders for rails placed some time ago, and which lately have not been coming in at all freely. It is expected also that rail mills will be operated more fully now that there is a prospect of the railroads being able to pay for their purchases. Most makers have been curtailing production in the fear of being obliged to tie up large sums of money on account of the financial conditions of the railroad treasuries. Light rails are moving rather slowly, with prices nominally unchanged.

We quote 25 to 45-lb. sections, rolled from new steel, 2.45c. to 2.75c.; standard rails, $45, mill, for Bessemer, and $47 for open-hearth sections.

Spikes.—Standard spikes are quoted by all makers at 3.65c., but no business is coming out and there is little question but that this price would be shaded. With merchant steel bars available as low as 2c., the spread between bars and spikes, a matter of $1.65 per 100 lb. as compared with the Industrial Board differential of $1 per 100 lb., and while conversion charges have increased since March 21, 1919, it is admitted that the present differential allows a very liberal profit. Attractive orders undoubtedly could be placed in standard spikes as low as 3.35c. Prices are given on page 604.

Billets, Sheet Bars and Slabs.—Business continues at a low ebb and in the lack of important transactions quotations merely are an appraisal of the possibilities of the market. While the past week has developed some increase in the occupation of sheet and tin plate mills, this has brought about no important demands for sheet bars and it is evident that most of the non-integrated mills have ample supplies of steel for their present requirements. Bar mill capacity is no more fully engaged this week than it has been for some time past and makers of strip steel also are operating on a much curtailed scale. The amount of plate mill capacity now engaged has not been so small in a long time as it is at present. Although the curtailment in the production of steel is in keeping with the operations of the finishing mills, the Youngstown district showing less than 30 per cent of the open-hearth furnaces in operation, and the Pittsburgh and Wheeling districts, as far as independent capacity is concerned, not running that high, the offerings of semi-finished steel are in excess of the demand. It is reported that a price as low as $38.50 Pittsburgh has been named by one maker of sheet bars and while it is believed that this price was made for special reasons and is therefore hardly a quotable price, it is known that other makers have offered tonnages at $40.

We quote 4 x 4-in. soft Bessemer and open hearth billets at $38.50; 2 x 2-in. billets, $40.50; Bessemer and open hearth sheet bars, $40 to $42; slabs, $41; forging billets, ordinary carbons, $43.50, all f.o.b. Youngstown or Pittsburgh mills.

Hot-Rolled and Cold-Rolled Strips.—Although makers generally continue to make public quotations of 3.30c. base for hot-rolled strips and of 6.25c. base for cold-rolled, no business lately has been done at above 3.05c. for the former, and 6c. about measures the maximum price possibilities to-day in cold-rolled strips. The report emanates from buying circles that some makers of hot-rolled strips have offered to take business at as low as 2.80c., the same base as hoops and bands. Starting up of some of the automobile plants has been productive of comparatively few releases against suspended tonnages and practically no new business.

Nuts, Bolts and Rivets.—Intimations still are heard that less than $3.90 and $4 has been quoted on rivets, although these are the public quotations of makers in this district. It is admitted, however, that the demand is extremely slow. A few orders are coming along daily for nuts and bolts, but they are not sufficient to increase plant operations in this district. One large maker is running four days a week, or about 60 per cent, but another, which has been operating at 70 per cent of capacity this week, will run at a lower rate because of the condition of its order book. Track bolts have dropped to $4.90 base per keg, a decline of $6 per ton. No change is noted in other kinds of bolts or in nuts, makers asserting that the last reduction anticipated current prices for rods and bars. Prices and discounts are given on page 604.

Coke.—The market continues in the buyers' favor despite the fact that production of beehive oven coke now is down to the lowest notch in about two years. The ratio of active merchant ovens in the Connellsville district to the total is 1 to 5, while less than 50 per cent of the furnace ovens are in operation. The H. C. Frick Coke Co. is reported to have put out 800 ovens in addition to those retired last week, making a total of close to 2500 ovens of this company now on the idle list. It is now figured that this company is not operating more than 50 per cent of its coal mines and coke ovens. Curtailment by this and the other producing companies has brought about an easier labor situation and predictions are freely made of a cut in wages at an early date. This expectation, as well as the desire to revive dormant coke contracts, is reflected in the price ideas of the independent oven operators. No trouble at all now is experienced in obtaining spot tonnages of standard furnace coke at $4.50 per net ton ovens and there are supplies which can be had as low as $4, although the tendency is to classify the latter as heating coke. This does not mean that it is not good enough for furnace use but rather that its principal use at present is for heating. The spot market on foundry coke is quotable from $5.50 to $6, the latter price now being quoted by a large interest which hitherto has asked $6.50. Contract coke is nominal in the absence of business.

Old Material.—No improvement can be reported in the demand, as steel works and foundry operations in this district are declining instead of gaining and dealers are having more trouble than recently in interesting melters in purchases. This too, despite the fact that

they have offered tonnages of open-hearth grades at concessions of about $1 per ton from recent levels. Dealers not only cannot effect sales, but they cannot pick up tonnages for throwing down in their yards at prices low enough to make such a course reasonably safe. It is evident that some of the steel companies which are maintaining some operation of open-hearth furnaces are dealing direct with producers. Dealers here report having failed to obtain any of the old material recently sold by the Westinghouse Electric & Mfg. Co., East Pittsburgh, and they do not seem to be getting much of the scrap offered by the railroads. The Pennsylvania Railroad, eastern region, is offering 17,840 net tons of scrap in its March list, bids against which must be in by 9 a. m., March 6. The largest items are 2750 tons of No. 1 heavy melting steel, 2000 tons of unsorted scrap, 1575 tons of No. 1 wrought and 1525 tons of No. 1 wheels.

We quote for delivery to consumers' mills in the Pittsburgh and other districts taking the Pittsburgh freight rate, as follows:

Heavy melting steel, Steubenville, Follansbee, Brackenridge, Monessen Midland and Pittsburgh	$15.00 to $16.00
No. 1 cupola cast	22.00 to 23.00
Rerolling rails, Newark and Cambridge, O.; Cumberland, Md.; Parkersburg and Huntington, W. Va.; Franklin, Pa., and Pittsburgh	17.00 to 18.00
Compressed sheet steel	12.50 to 13.00
Bundled sheet sides and ends, f.o.b. consumers' mills, Pittsburgh district	10.50 to 11.50
Railroad knuckles and couplers	15.50 to 16.50
Railroad coil and leaf springs	15.50 to 16.50
Railroad grate bars	14.00 to 14.50
Low phosphorus melting stock, bloom and billet ends, heavy plates, ¼-in. and heavier	23.00 to 24.00
Railroad malleable	15.00 to 16.00
Iron car axles	36.00 to 37.00
Locomotive axles, steel	31.00 to 32.00
Steel car axles	21.00 to 22.00
Cast iron wheels	21.00 to 22.00
Rolled steel wheels	15.50 to 16.50
Machine shop turnings	9.50 to 10.00
Sheet bar crop ends at origin	15.00 to 16.00
Heavy steel axle turnings	12.50 to 13.00
Short shoveling turnings	11.50 to 12.50
Heavy breakable cast	16.00 to 17.00
Stove plate	15.00 to 16.00
Cast iron borings	12.00 to 12.50
No. 1 railroad wrought	15.00 to 16.00

British Iron and Steel Market

Conditions Growing Much Worse, Due to Low Quotations from Continent

(By Cable)

LONDON, ENGLAND, March 1.

More furnaces are blowing out, as the pig iron position is generally unchanged and there is practically no home demand. Export business is stagnant. Consumers urgently needing supplies are purchasing Continental pig iron. Hematite iron is weak, as home consumers are buying only from hand to mouth. Small lots have been sold to Italy, but there is little other inquiry.

Foreign ore is quiet. Bilbao Rubio ore is quoted at 37½s. ($7.28) ex-ship Tees.

In steel the position is growing worse. Makers are attempting to secure orders by cutting prices, but export demand has practically disappeared and home users are buying Continental material. Germany is offering billets at £8 5s. ($32) f. o. b.

Clyde shipbuilding for February totaled twenty vessels of 83,278 gross tons. A serious coal crisis is threatened on government relinquishing of financial control at the end of March.

The tinplate central selling agency scheme has been finally abandoned. The market is weak, having gone down on forced liquidation to 27½s. ($5.34) per base box, f. o. b. Makers are quoting 30s. ($5.82) basis f. o. b. for March and April shipments. Quarter wasters have sold at 14s. ($2.72) f. o. b. Galvanized sheets have been sold by the works at £24 10s. ($95) f. o. b.

We quote per gross ton except where otherwise stated, f. o. b. maker's works, with American equivalent figured at $3.88 per £1, as follows:

Midland coke	£2	14½			$10.57
Cleveland basic	9	0 to	£9	5*	34.92 to 35.89
Cleveland No. 1 foundry	10	0 to	10	5*	38.80 to 39.77
Cleveland No. 3 foundry	9	15 to	10	0*	37.83 to 38.80
Cleveland No. 4 foundry	9	14 to	9	19*	37.64 to 38.61
Cleveland No. 4 forge	9	12½ to	9	17½*	37.35 to 38.32
East Coast mixed	11	0			42.68
East Coast hematite	12	0			46.56
West Coast hematite	12	0			46.56
Ferromanganese	24	0			93.12
Ship plates	21	0 to	22	0	81.48 to 85.36
Boiler plates	27	0 to	29	0	104.76 to 112.52
Tees	18	10 to	20	10	71.78 to 79.54
Channels	17	15 to	19	5	68.87 to 74.69
Beams	18	0 to	20	0	69.84 to 77.60
Round bars, ¾ to 3 in.	17	10 to	20	0	67.90 to 77.60
Rails, 60 lb. and up	18	0 to	21	0	69.84 to 81.48
Billets	13	10 to	14	10	52.38 to 56.26
Sheet and tin plate bars, Welsh	14	0 to	14	10	54.32 to 56.26
Galvanized sheets, 24 g.	24	10 to	26	0	95.06 to 100.88
Black sheets	23	0 to	24	0	89.24 to 93.12
Tin plate base box	1	7 to	1	10	5.24 to 5.82
Steel hoops	27	0			104.76

*Export price.

Stagnation in Domestic and Export Trade—Wage Reduction Probable—Shipbuilding Depressed

LONDON, ENGLAND, Feb. 17.—The figures relating to exports and imports in January give a concrete illustration of the manner in which trade has diminished during the past 12 months. Exports were down by £28,500,000 and the imports by about £66,000,000 compared with the same month of 1920. The chief declines in exports were in coal, nearly £6,000,000 and in cotton and woollen manufactures about £10,700,000. There was an increase of £4,700,000 in the exports of iron and steel manufactures.

The managing director of the Shelton Iron Steel & Coal Co., Stokeon-Trent, is reported as stating that part of his iron and steel works had closed, owing to stagnation of trade, and that unless there was a change for the better the whole works would be shut down soon and 3000 men would be unemployed. He further remarked that the world would not pay £20 to £25 a ton for steel, and to produce it at a lower cost coal, wages, and everything must come down.

There are many indications that the question of a general reduction in wages will soon be put to the test. The Shipbuilding Employers Federation is holding an important conference at Edinburgh when the whole question of production costs will be reviewed. Miners' wages are automatically falling. Many collieries have closed down, and in others 14 days notice has been given to the miners. A cargo of American coal was recently delivered to the Thames by a gas and coke company purchased here.

Conditions in the iron and steel trades are still far from cheerful. Makers of pig iron are unable to dispose of their output, and producers are being compelled to damp down furnaces. The number of furnaces actually in blast on the North East Coast according to last advices is only 61 against 74 at the end of 1920. Meanwhile Cleveland makers have withdrawn the fluctuation clause in contracts, and have decided to sell only at fixed prices. This step, however, is not one likely to encourage business. Export buying is stagnant.

In the finished steel, things are far from satisfactory, orders being exceedingly scarce while semi-finished and finished steel is continually being offered by Continental producers at cut prices. Continental billets have been sold at £9, delivered, Glasgow. Many Belgian works seem to have withdrawn offers for the moment, but French and Luxemburg works continue to press sales. A 7000 ton rail order for Brazil is stated to have gone to a Luxemburg firm.

It is understood that Sir W. G. Armstrong, Whitworth & Co. have received an order to repair a large number of Russian locomotives subject to the conclusion of a trading agreement. It is stated that arrangements are being made provisionally for the engines to be shipped to the Tyne from Russia at the rate of over 20 per month. The execution of the contract will occupy several years.

The shipbuilding industry continues depressed so far as new business is concerned although in some quarters there is a good deal of work on hand.

Chicago

CHICAGO, March 1.

The operations of the leading steel interest have been further curtailed, its active blast furnaces now numbering 16 on iron and one on ferromanganese out of 29 stacks in this district. Its steel output has dropped to about 60 per cent of ingot capacity. Independent operations are of an intermittent character, but average about the same as heretofore. The Inland Steel Co. has reduced its sheet mill operations, but is running both its plate mill and its 24-in. structural mill in addition to its continuous merchant mill. Its Chicago Heights hard steel bar mill is idle, as are the other rail carbon steel plants in the territory.

The market is quiet in most departments, but there are evidences that a substantial dormant demand is being held back because of the nervous price situation. Although there have been no official intimations to encourage the belief, there is nevertheless a rather widespread expectation on the part of consumers that the Steel Corporation will announce new prices, possibly for second quarter, which will tend to stabilize the market and restore the confidence of the trade. It is freely admitted that if present uncertainty continues for an indefinite period deferred needs may accumulate into such substantial proportions as to stimulate prices when buying is finally resumed. The present business situation, though marked by dullness and weakness in prices, is not without some encouraging aspects. In the fabricating field an increasing amount of work is being figured on, although as yet lettings are few. Some projects, notably storage tanks for the oil fields, are going ahead without delay because the time element is important. State road building programs are particularly large this year, but action on these awaits development in the material markets. The signing of the Winslow bill by the President is expected to improve the financial condition of the railroads and thus bring out some purchases which have been postponed. At the same time it will tend to ease the money market by permitting the liquidation of accounts which mills, railway supply and equipment companies have been carrying for the carriers. In this connection it is reported that one large locomotive builder has nearly $30,000,000 owing to it from various railroads.

In prices there are few new developments of importance except in pig iron, which certain recent transactions would indicate is to a new low level.

Ferroalloys.—The market remains quiet and prices are weak, with spiegeleisen definitely on a lower level, material having been offered from a furnace at from $40 to $42, delivered.

We quote 75 to 80 per cent ferromanganese, $90 to $95 delivered; 50 per cent ferrosilicon, $92 to $95 delivered; spiegeleisen, 18 to 22 per cent, $40 to $42 delivered.

Pig Iron.—The market remains dull, with prices even more uncertain than heretofore. It is difficult to name ruling quotations, as the terms of recent transactions have been diverse. A melter in this State has purchased 500 tons of malleable at $28, delivered, or slightly more than $25, Chicago, while a Wisconsin foundry is reported to have bought 2000 tons of foundry at $26, delivered. A large steel interest was offered 2000 tons of resale basic at $26, Chicago, and another consumer was quoted $25 on the same commodity for delivery over several months. As against these prices are those which have prevailed in small sales, principally carlots, which have brought $2 to $3 per ton more. A sale of 200 tons of malleable was made at $27, Chicago. Some resale lots of low phosphorus have figured in the local market of late. Offerings having been made at all the way from $38 to $45, delivered, the higher prices being asked for copper free material. One lot of 500 tons of resale material was sold during the past week at approximately $40, delivered. Charcoal is now being more generally quoted at $35, furnace, and it is doubtful whether the old quotation of $37 is more than nominal in the case of any producer. Silvery prices are weak and fluctuating, but 7 per cent appears to be available at about $41, delivered, and 8 per cent at $42.

Southern foundry is not finding a sale in this territory, and it is difficult to ascertain what going quotations are, although it is reported that $26.50 to $27 base Birmingham would be done by producers.

The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable and steel-making irons, including low phosphorus, which are f.o.b. furnace and do not include a switching charge averaging 70c. per ton:

Lake Superior charcoal, averaging sil. 1.50, deliv. at Chicago	$38.50
Northern coke, No. 1 sil. 2.25 to 2.75	$28.25 to 29.25
Northern coke foundry, No. 2, sil. 1.75 to 2.25	27.00 to 28.00
Northern high phos	27.00 to 28.00
Southern coke, No. 1 foundry and No. 1 soft, sil. 2.75 to 3.25	37.17
Southern coke, No. 2 foundry, sil. 2.25 to 2.75	35.42
Southern foundry, sil. 1.75 to 2.25	34.17
Malleable, not over 2.25 sil	26.50 to 28.50
Basic	25.00 to 27.00
Low phos. Eastern furnace (copper free)	40.00
Silvery, sil. 7 per cent	41.00

Plates.—The price situation has undergone little change. Independent quotations range from 2.20c. to 2.25c., Pittsburgh, for tank plates, but it is probable that an attractive inquiry would bring out lower figures. Not taking into account the pending inquiries from car builders, the demand is not without encouraging features. A local mill has booked 1600 tons of plates and structural shapes for oil storage tanks in Arkansas. There is a growing demand for tanks from the country and generally immediate delivery of material is desired. This turn of events is accounted for by the fact that although the oil consumption has fallen off some, producers have continued to pump, thus forcing their neighbors to do likewise or lose their share of the oil in the field. The Union Pacific has ordered 14 dining cars from the Pullman Co., the steel for which amounting to about 200 tons of plates, shapes and bars, will be furnished by the leading steel interest.

The mill quotation is 2.20c. to 2.65c., Pittsburgh, the freight to Chicago being 38c. per 100 lb. Jobbers quote 3.78c. for plates out of stock.

Cast Iron Pipe.—New business continues to develop in fair proportions, althqugh it is apparent that much municipal work is still being delayed because of the nervous condition of the entire iron and steel market. A factor which must not be overlooked in connection with contemplated buying is the element of freight. The advances of last August have brought the delivered prices on pipe in the case of long hauls to such a high figure that the use of wood pipe or some other substitute has been encouraged, although cast iron pipe is wanted. It is felt by the trade that the new rates do not actually result in increased revenue because they discourage traffic. There is ample concrete evidence of this contention wherever water competition is a factor. One large pipe company recently discovered that it could deliver a tonnage to a Texas point cheaper by shipping via water from New Jersey than by rail from Alabama, although its latter plant was much nearer to destination. The United States Cast Iron Pipe & Foundry Co. is low bidder on 589 tons for Detroit. Recent lettings include:

Lewiston, Mont., 304 tons of 12-in. to the United States Cast Iron Pipe & Foundry Co., and 330 tons of 14-in. to the American Cast Iron Pipe Co.

Cincinnati, 100 tons to United States Cast Iron Pipe & Foundry Co.

Rockford, Ill., 300 tons to United States Cast Iron Pipe & Foundry Co.

Current inquiries include:

Detroit, 790 tons of 12 to 42-in.; bids in March 2.

Wauconda, Ill., 237 tons, March 11.

Spring Wells, Mich., 450 tons of 6, 8 and 12-in., March 1.

We quote per net ton f.o.b. Chicago, ex-war tax as follows: Water pipe, 4-in., $69.10; 6-in. and above, $64.10; class A and gas pipe, $4 extra.

Wire Products.—Independents continue to undercut the leading interest but without bringing out much business. Although a quotation of $3.10 base per keg, Pittsburgh, on nails is still occasionally reported, the tendency seems to be to try to establish a differential of 25c. between wire and nails, making the nail price $3.25 as against a price of $3 per 100 lb. on bright basic wire. Of the various wire commodities, poultry netting alone is in good demand. The usual spring buying movement has not yet started. For mill prices see finished iron and steel, f.o.b., Pittsburgh, page 604.

Rails and Track Supplies.—The signing of the Winslow bill is expected to result in releasing much railroad business which has been pending. Buying of

track bolts and spikes in small quantities, ranging from 500 to 1000 kegs, has been of fair proportions of late and the improved financial standing of the railroads should mean an expansion of purchasing programs. There are several good sized inquiries for tie plates in the market, among them 6000 tons wanted by the Rock Island and 3000 tons each by the Big Four and the Michigan Central. On the whole, prices of track supplies are holding rather firmly. The railroads continue to push the mills for rail deliveries. Municipal electric lines are looking to their requirements in rails and track fastenings. Outside of an inquiry for 6000 tons of rails from the Alaskan Engineering Commission, no new tonnages of size have appeared.

Standard Bessemer rails, $45; open-hearth rails, $47; light rails, 2.75c. f.o.b. makers' mills.

Standard railroad spikes, 3.65c., Pittsburgh. Track bolts with square nuts, 4.60c., Pittsburgh. Steel tie plates, 3c., and steel angle bars, 2.75c., Pittsburgh and Chicago; tie plates, iron, 3c., f.o.b. makers' mills.

Bars.—Independent quotations on mild steel bars range from 2.10c., Pittsburgh, for fair sized tonnage to 2.25c. for carload. The market remains quiet but not without a few encouraging features. More highway construction is now under consideration than ever before and if the work goes ahead, reinforcing bars as well as sheets will be bought for bridges, culverts, etc. Makers of bar iron regard the President's signing of the Winslow bill as a favorable portent, as it will tend to release business which the railroads have been forced to postpone because of their financial straits. Ruling quotations on this commodity vary from 2.60c., Chicago, to 2.68c., the range being accounted for by the unsatisfactory operating situation. On business on which prompt delivery was wanted, 2.68c. has been obtained by mills which are in operation while lower prices are available when the time element is not so important to buyers. Rail carbon steel bar capacity in this district is idle and prices quoted below are to be regarded as nominal.

Mill prices are: Mild steel bars, 2.10c. to 2.35c., Pittsburgh, taking a freight of 38c. per 100 lb.; common bar iron, 2.60c. to 2.68c., Chicago; rail carbon, 2.20c. to 2.50c. mill, nominal.

Jobbers quote 3.48c. for steel bars out of warehouse. The warehouse quotation on cold rolled steel bars is 5.25c. for rounds and 5.75c. for flats, squares and hexagons, an extra of 15c. per 100 lb. applying to orders exceeding 1000 lb. and under 2000 lb. and an extra 35c. on orders up to 1000 lb. Jobbers quote hard and medium deformed steel bars at 3.48c. base.

Sheets.—Demand remains unsatisfactory and independent prices range from 4c. to 4.10c. Pittsburgh on No. 28 black, and 5.20c. to 5.25c. on No. 28 galvanized, while No. 10 blue annealed is rather generally quoted at 3.25c. Increasing operations at the Ford plant have released some tonnage on contract, 300 tons thus far in the case of local producers. Owing to a temporary shortage of sheet bars, the local independent has curtailed operations, 10 of its 18 mills still being active. This situation resulted from the fact that steel bookings were in excess of active steel making capacity, yet not sufficiently large to justify blowing in the company's idle blast furnace.

Mill quotations are 4.10c. to 4.35c. for No. 28 black; 3.25c. to 3.55c. for No. 10 blue annealed, and 5.20c. to 5.70c. for No. 28 galvanized, these all being Pittsburgh prices, subject to a freight to Chicago of 38c. per 100 lb.

Jobbers quote: Chicago delivery out of stocks, No. 10 blue annealed, 4.68c.; No. 28 black, 5.75c.; No. 28 galvanized, 7.10c.

Bolts and Nuts.—The market is exceedingly weak and quotations published under mill prices f.o.b. Pittsburgh, page 604, are rapidly becoming nominal so far as this territory is concerned.

Jobbers quote structural rivets, 5.08c.; boiler rivets, 5.18c.; machine bolts up to ⅝ x 4 in., 50 per cent off; larger sizes, 45 off; carriage bolts up to ⅝ x 6 in., 40 off; larger sizes, 40 off; hot pressed nuts, square and hexagon tapped, $1.60 off; blank nuts, $1.85 off; coach or lag screws, gimlet points, square heads, 50 and 5 per cent off. Quantity extras are unchanged.

Structural Material.—Ruling independent quotations on plain material range from 2.20c. to 2.25c., Pittsburgh, but a particularly attractive tonnage might induce even lower prices. In the fabricating field a considerable amount of work is being figured on and there are some lettings, principally small tonnages. Much contemplated work, however, is being delayed pending a stabilization of price which in the opinion of many buyers will not come until the leading steel interest makes an adjustment of its prices and it is evident that such an adjustment is looked for despite the fact that no announcement has been made which would indicate that such action is contemplated. Among current fabricating jobs oil storage tanks figure prominently, increased storage capacity being necessary on account of the decline in oil consumption. Recent lettings include:

High school, Luverne, Minn., 128 tons, to L. D. Sison Co., Minneapolis.

State of Illinois, two highway spans near Effingham, 153 tons, to Northwestern Bridge & Iron Co.

Mead Morrison Mfg. Co., Chicago, 110 tons for coal bridge in Porto Rico, to unnamed fabricator.

City of Milwaukee, reconstruction, Twenty-seventh Street viaduct, 60 tons, to Milwaukee Structural Steel Co.

Nash Motors Co., additional machine shop unit, Milwaukee works, 50 tons, to Northwestern Bridge & Iron Co.

City of Superior, Wis., 100-foot span, Bardon Avenue, 50 tons, to Worden-Allen Co.

Current inquiries include:

American Tar Products Co., Chicago, tanks and stills, 628 tons.

Sinclair Refining Co., two oil storage tanks in Texas, 435 tons.

United States Bureau of Yards and Docks, seaplane hangar, San Diego, Cal., 423 tons.

Luce Sugar Cane Harvester Co., Watertown, Wis., 100 tons for plant structure.

The mill quotation is 2.20c. to 2.45c., Pittsburgh, which takes a freight rate of 38c. per 100 lb. for Chicago delivery. Jobbers quote 3.58c. for materials out of warehouse.

Old Material.—The market is exceedingly dull and with the leading steel interest curtailing operations and the independents showing little improvement, sellers see little that promises a better demand. All grades of scrap are weak and many of them have declined in price. The Baltimore & Ohio, Chicago Terminal, offers 1000 tons and the Michigan Central and the Lake Erie & Western have advertised blind lists.

We quote delivery in consumers' yards Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton	
Iron rails	$20.50 to $21.00
Relaying rails	32.50 to 37.50
Car wheels	19.00 to 19.50
Steel rails, rerolling	14.50 to 15.00
Steel rails, less than 3 ft.	16.00 to 16.50
Heavy melting steel	14.00 to 14.50
Frogs, switches and guards, cut apart	14.00 to 14.50
Shoveling steel	14.00 to 14.50
Low phos. heavy melting steel	17.00 to 17.50
Drop forge flashings	9.50 to 10.00
Hydraulic compressed sheet	11.50 to 12.00
Per Net Ton	
Iron angles and splice bars	19.50 to 20.00
Steel angle bars	13.00 to 13.50
Iron arch bars and transoms	18.50 to 19.00
Iron car axles	34.50 to 35.00
Steel car axles	16.50 to 17.00
No. 1 busheling	12.00 to 12.50
No. 2 busheling	8.50 to 9.00
Cut forge	12.75 to 13.25
Pipes and flues	9.75 to 10.25
No. 1 railroad wrought	13.00 to 13.50
No. 2 railroad wrought	12.75 to 13.25
Steel knuckles and couplers	13.00 to 13.50
Coil springs	16.00 to 16.50
No. 1 cast	16.75 to 17.25
Low phos. punchings	14.50 to 15.00
Locomotive tires, smooth	11.00 to 12.00
Machine shop turnings	6.50 to 7.00
Cast borings	9.00 to 9.50
Stove plate	17.00 to 17.50
Grate bars	12.50 to 13.00
Brake shoes	12.00 to 12.50
Railroad malleable	15.00 to 15.50
Agricultural malleable	15.00 to 15.50
Country mixed	9.50 to 10.00

Birmingham

BIRMINGHAM, ALA., March 1.

Pig Iron.—February closed with the iron market admittedly on a base of $26.50 to $27.50. During the last week one furnace interest sold several lots, including one for 500 tons, at $26.50. Prevailing business, which was small, had been going at $27.50, this being the price allowed on as low as a car lot. One furnace operator said: "We did a larger business in February than we had done since last August." This does not mean a large business, but it means better than in five months. Another furnace interest was surprised to look over books and discover that it had more than sold the make of a large stack. A third also claims to have just about sold the make of one stack. These three interests are those that appear to have figured in the buying following the recessions first to $35, then to $30 and three weeks ago to $27.50. Business this week will probably be on the new base of $26.50 set up by one maker. Large tonnage would

attract still lower quotations, but how low remains to be seen. The tonnage must first be offered. The leading feature of the orders that are booked is the demand for rush shipment. This has followed not only the carload orders from the small foundries, but the orders from sanitary manufacturing, radiator and stove interests as well. Iron makers are also noticing that new customers enter the market with each batch of orders. This indicates to them that there is a regular increase in the number of consumers who are short of iron. Consumers are as obstinate as ever about taking the high-priced iron ordered last year. Increase in orders for water pipe encourages furnace operators to look for buying in that quarter. Cuba and the Pacific Coast have lately inquired for pig iron in small lots, but ocean rates to Cuba on small lots are almost prohibitive, while Chinese iron, particularly a lot of 500 tons, has been offered on the coast at $35 delivered, which corresponds to $22 Birmingham. The Sloss-Sheffield and Alabama companies have lately moved small quantities to the Pacific Coast via ship out of Mobile. We quote per gross ton f.o.b. Birmingham district furnaces, as follows:

We quote per gross ton f.o.b. Birmingham district furnace, the Tennessee company included, as follows:

Foundry, sil, 1.75 to 2.25	$26.50 to $27.50
Basic	25.50 to 26.50
Charcoal	40.00

Cast Iron Pipe.—The base of sanitary pipe remains at $55, with some shops especially anxious to do current business cutting under. Anniston shops are still down, but the Gadsden shops are fairly active. New business is scattering, but makers agree that building is already more active in the South and look for a gradual improvement. The United States Cast Iron Pipe & Foundry Co. has booked 2000 tons for Breckenridge, Tex., water pipe, sizes 6 to 16 in. The American Cast Iron Pipe Co. got an order for a similar quantity for the same place. Delivery is prompt. The American Cast Iron Pipe Co. also booked 600 tons for Miles City, Mont. The leading interest is operating shops at Birmingham and Anniston, but Bessemer and Chattanooga are still down. Schedule for gas and water pipe remains at $55 base. The steamer Cape Henry left Mobile on Feb. 25 with 2500 tons of water, gas, oil and sanitary pipe for the Pacific Coast, carrying also two small lots of pig iron. Other movements are to follow. Rival steamship lines are bidding for this movement and rates are being lowered. As it is, movement by boat out of Mobile saves $15 per ton on the all-rail rate.

Coal and Coke.—The Alabama coal mine strike was declared off on Feb. 22, miners and operators agreeing to allow the governor to settle the controversy and to abide by his decision. The governor has sent a committee of three disinterested citizens to investigate and report to him. He will then render his decision. Troops have been withdrawn. Operators have more men now than they can furnish full work for, production having fallen below normal on account of lack of demand.

Old Material.—There is nothing to be said of the old material market. It has been lifeless for weeks.

We quote per gross ton, f.o.b. Birmingham district yards, prices to consumers, as follows:

Old steel rails	$13.00 to $13.50
No. 1 heavy steel	12.50 to 13.00
No. 1 cast	18.00 to 19.00
Car wheels	18.00 to 19.00
Tramcar wheels	16.00 to 17.00
No. 1 wrought	15.00 to 16.00
Stove plate	12.00 to 12.50
Cast iron borings	5.00 to 6.00
Machine shop turnings	5.00 to 6.00

Buffalo

BUFFALO, March 1.

Pig Iron.—Local producers have dropped from the $30 base price. Until this week none of the local interests admitted sales at less than $30 except small lots of resale iron, but the approximate tonnage sold by one interest in the week, aggregating 1000 tons, went at $28 base. A broker's sale of 300 tons of No. 2X Iron at $28 is reported. Resale moved a trifle faster. One company sold 2000 tons and claims to have obtained $30 base for most of the lot. Another company is not trying for business at prices quoted by competitors. Many foundries are down because of strikes of molders. This class of labor is seeking to retain present wage scales rather than fighting for increases.

We quote f.o.b. dealers' asking prices per gross ton Buffalo as follows:

No. 1 foundry, 2.75 to 3.25 sil.	$31.00 to $33.00
No. 2X foundry, 2.25 to 2.75 sil.	29.25 to 31.25
No. 2 plain, 1.75 to 2.25 sil.	28.00 to 30.00
Basic (nominal)	30.00
Malleable (nominal)	32.00
Lake Superior charcoal	40.64

Finished Iron and Steel.—The net result of price reduction has been to increase inquiry and decrease orders, according to one observer. The apathy among bar, shape and plate mills is not shared by a wire mill; the latter reporting brisk business in poultry wire, screen cloth, spring wire and other specialties. A company which recently started a 10-in. bar mill expects to shut down, saying it cannot consider orders at 2.10c. on bars. Another company is adhering to the Industrial Board schedule. Inquiry is a little improved. A sheet mill will be in 50 per cent of operation this week and finds the volume of orders increasing.

Warehouse Business.—An increase in the volume of business is noted. Most of the business is from out of Buffalo; orders from Pennsylvania and central New York principally. Many transactions are made, but buying is hand-to-mouth. A further reduction is looked for by a prominent warehouseman who states the present unsettled mill schedule will not continue and with stabilization will come a readjustment of warehouse prices.

Jobbers quote prices f.o.b. Buffalo as follows: Structural shapes, 3.60c.; plates, 3.80c.; plates, No. 8 gage, 4.65c.; soft steel bars and shapes, 3.50c.; hoops, 4.60c.; blue annealed sheets, No. 10 gage, 4.70c.; galvanized steel sheets, No. 28 gage, 7.10c.; black sheets, No. 28 gage, 5.75c.

Old Material.—Buying is no better. Only one mill has bought any material and is interested only in best grades of heavy melting steel.

We quote dealers' asking prices per gross ton, f.o.b. Buffalo, as follows:

Heavy melting steel	$15.00 to $16.50
Hydraulic compressed	11.50 to 12.50
Low phos., 0.04 and under	20.00 to 21.00
No. 1 railroad wrought	19.00 to 20.00
No. 1 machinery cast	20.00 to 21.00
Iron and steel axles	30.00
Car wheels	20.00 to 21.00
Railroad malleable	15.50 to 16.50
Machine shop turnings	10.50 to 11.50
Heavy axle turnings	13.50 to 14.50
Clean cast borings	10.00 to 11.00
Iron rails	21.00 to 22.00
Locomotive grate bars	14.00 to 15.00
Stove plate	17.00 to 18.00
Wrought pipe	13.00 to 14.00
No. 1 busheling	12.00 to 13.00
Bundled sheet stampings	9.00 to 10.00

New York

NEW YORK, March 1.

Pig Iron.—While some sellers report more active inquiry and cite as evidence one inquiry for 1000 tons and another for 800 tons and several for smaller tonnages, mostly for early delivery, the general feeling in the trade is that there is little, if any, improvement in the situation, and the price tendency still seems to be downward. Eastern Pennsylvania iron has been sold as low as $27.50, furnace, base, but nothing lower is confirmed in this district. Some contracts are being readjusted by revising the contract price on a 50-50 basis; that is, if the price at which the iron was sold is $10 higher than the price now prevailing, the new price inserted is made $5 higher than the present quotation. In this way, some shipments have been started, whereas otherwise there would be no movement of the iron and nothing paid. Owing to the fact that very few merchant furnaces are in blast in the Eastern territory, some important melters are wondering whether there may not be a scarcity later, but there certainly is no immediate danger of such a condition.

We quote delivered in the New York district as follows, having added to furnace prices $2.52 freight from eastern Pennsylvania, $5.46 from Buffalo and $6.16 from Virginia:

East. Pa. No. 1 fdy., sil. 2.75 to 3.25	$32.52 to $33.52
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	30.77 to 31.77
East. Pa. No. 2 fdy., sil. 1.75 to 2.25	29.52 to 30.52
Buffalo, sil. 1.75 to 2.25	33.46 to 35.46
No. 2 Virginia, sil. 1.75 to 2.25	33.16 to 34.16

Ferroalloys.—The market for ferromanganese and spiegeleisen is exceedingly dull. Inquiry for the former is confined to carload lots which can be obtained at $92 to $95, delivered, for the American alloy, the British alloy being still quoted at $100, seaboard. The fact that independent producers and smaller steel makers are operating at a sharply reduced capacity explains in a large measure the inactivity of this market, the leading interest producing its own ferromanganese. Spiegeleisen for early delivery is obtainable at around $35, furnace, but no business is reported. No demand appears to exist for manganese ore, which is nominally quoted at 35c. per unit, seaboard, although it is understood that a cargo of ore on the way here is offered at 30c., seaboard. The 50 per cent ferrosilicon market is devoid of activity and quotations are nominal at $92 to $95 per ton, delivered. Quotations for lump ferrotungsten, guaranteed, are 58c. per lb. contained tungsten. On Jan. 15 quotations for ferrovanadium by the leading interest were changed so that the standard alloy for open-hearth practice, high in silicon, is quoted at $5 per lb. of contained vanadium as a base, with 75c. to $2 per lb. extra as differentials asked for the other grades of alloy. Ferrochromium, 4 to 6 per cent carbon, is quoted at 16c. to 16.50c. per lb. of contained chromium, f.o.b. producer's plant, at which level some fair sized sales are noted. Ferrocarbontitanium, 15 to 18 per cent, is selling at $200 per net ton in carload lots, at $220 per ton in lots between one ton and a carload, and at $250 per ton in lots less than a ton.

Finished Iron and Steel.—There is so little steel business in the market that sellers, like buyers, are devoting their thoughts mainly to the probable future course of prices and in particular to what the Steel Corporation may do. Buyers are placing only very small orders for immediate shipment. The total volume which is coming to some of the independent companies is not sufficient to maintain even the moderate degree of resumption which became effective among Eastern mills about Feb. 1. Railroads continue to stay out of the market, and even the passage of the Winslow bill is not expected to stimulate buying of cars and locomotives, at least not immediately, though the payment of this money will have a beneficial effect in relieving some companies which have been unable to obtain payment of obligations due them from the railroads. The Reading Iron Co. has announced a reduction of $8 to $10 a ton on wrought iron pipe, effective March 1. This company's prices on cut nails were reduced several weeks ago, now being 4c., Pittsburgh, for carload lots and 4.25c. for less than carloads. In the bar iron market there is little activity. The nominal price remains at 2.35c., Pittsburgh, but at least one mill would shade this price for desirable business. The United States Shipping Board took bids last Friday on twelve 55,000 bbl. fuel oil tanks. There were 40 bidders, the bids ranging from $126,000 to $316,000, f.o.b. maker's works. The lowest bid was put in by the Pittsburgh-Des Moines Steel Co., Neville Island, Pittsburgh. No award has been made. The Varick Street post office, New York, requiring 2200 tons, has been awarded to the George A. Just Co., Long Island City. The Belmont Iron Works received the contract for an addition to the Federal Reserve Bank, Richmond, Va., 400 tons. The Beard Estate, Brooklyn, through Post & McCord, contractors, has awarded the steel, 900 tons, to the Phoenix Bridge Co. The Dime Bank Building, Scranton, Pa., 200 tons, was awarded to the Bethlehem Fabricators, Inc.

We quote for mill shipments, New York, as follows: Soft steel bars, 2.38c. to 2.73c.; plates, 2.48c. to 3.03c.; shapes, 2.48c. to 2.83c.; bar iron, flats, wider than 6 in., 3.23c., with half extras; light rounds, squares and flats, 3.73c., with full extras, and other sizes, 2.73c., with half extras.

Warehouse Business.—Prices are unchanged. With business still sluggish, most warehouse men are watching the leading interest in expectation of action on prices both at mill and from warehouse. No immediate change is expected, although prices on many materials are nominal. Owing to the action of the Reading Iron Co. and the A. M. Byers Co. in reducing prices on iron pipe from $8 to $10 per ton, warehouses will revise prices downward. Galvanized sheets, No. 28 gage, are still quoted by the foremost independent warehouse at 7.23c. per lb., but this price generally applies to small lots of a few bundles, current quotations being met on larger orders. A large warehouse finds its daily orders running from 250 lb. to 1000 lb. with a few exceptions totaling two or three tons.

High Speed Steel.—Quotations on 18 per cent tungsten high speed steel are generally from $1.10 to $1.15 per lb., with sales reported at $1. A fairly large inquiry recently appeared in the market from a local manufacturer of drills, taps and dies for 15,000 lb. of high speed steel.

Cast Iron Pipe.—More optimism has been injected into the trade by inquiries from and sales to a group of municipalities; also by more inquiries from private consumers, one manufacturer having received more inquiries the past week than during the preceding two months. Several of these inquiries come from New England. The United States Cast Iron Pipe & Foundry Co. has received orders for 500 tons of 6 to 20-in. pipe for Buffalo and for 600 tons for New York. Syracuse, N. Y., opened bids on Feb. 28 for 625 tons of 6 to 12-in. pipe. Freehold, N. J., will open bids for 600 tons of 6 to 12-in. pipe on March 11. R. D. Wood Co., Philadelphia, secured an order for 500 tons from Trenton, N. J. We quote f.o.b., New York: 6-in. and larger, $63.30; 4-in., $73.30; 3-in., $83.30, with $4 additional for Class A and gas pipe.

Old Material.—Conditions are even duller than in the immediate past and prices have receded from 50c. to $2. Though $14.25 has been secured for heavy melting steel delivered to eastern Pennsylvania, the more common figure is $13. A Pittsburgh district consumer offered to pay $15 delivered for 1000 tons of scrap in this district. A Bridgeport, Conn., manufacturer has been buying some stove plate; there is some demand for pipe and cast. It is difficult to secure more than $9, delivered eastern Pennsylvania, for mixed borings and turnings.

Buying prices per gross ton, New York, follow:

Heavy melting steel	$9.50 to $10.00
Rerolling rails	14.00 to 15.00
Relaying rails, nominal	42.50 to 45.00
Steel car axles	15.00 to 16.00
Iron car axles	33.00 to 34.00
No. 1 railroad wrought	14.50 to 15.00
Wrought iron track	10.50 to 11.00
Forge fire	8.50 to 9.00
No. 1 yard wrought, long	13.00 to 14.00
Light iron	5.00 to 6.00
Cast borings (clean)	8.00 to 8.50
Machine-shop turnings	7.50 to 8.00
Mixed borings and turnings	6.00 to 7.00
Iron and steel pipe (1 in. diam. not under 2 ft. long)	10.50 to 11.00
Stove plate	15.00 to 15.50
Locomotive grate bars	12.00 to 13.00
Malleable cast (railroad)	13.00 to 14.00
Old car wheels	17.00 to 18.00

Prices which dealers in New York and Brooklyn are quoting to local foundries, per gross ton:

No. 1 machinery cast	$21.00 to $22.00
No. 1 heavy cast (columns, building materials, etc.), cupola size	20.00 to 21.00
No. 1 heavy cast, not cupola size	16.00 to 17.00
No. 2 cast (radiators, cast boilers, etc.)	16.00 to 17.00

St. Louis

ST. LOUIS, March 1.

Pig Iron.—There is practically no inquiry in this market for pig iron and the occasional sale of a carload or two is only in the case of some special need and always for prompt delivery. Absolutely no contracting ahead is going on and furnace representatives are for the most part engaged in negotiations with melters for the delivery of pig iron which has previously been bought and at high prices, $42 or better. Melters are taking a firm stand against being compelled to take in iron at such prices, but there is an occasional instance in which iron is ordered forward at the contract price, though it must be confessed that such instances are few and far between. The lowest price which has been quoted in this section and that only by one furnace has been $27.50, Birmingham, for No. 2 Southern.

Coke.—There is as little life to coke as to the pig iron market and no contracting ahead is being done by any of the melters in this district. Connellsville best selected 72-hr. coke is quoted at $6 to $7.50 for future

delivery according to the brand, but none is selling. Wise County coke is quoted at $9 per ton and New River coke at $13 per ton.

Finished Iron and Steel.—In finished products there has been no change either in the mill and contracting field or in the warehouse situation. Very little material of any character is moving and the demand shows no indication of improvement in either quarter.

For stock out of warehouse we quote as follows: Soft iron bars, 3.57½c.; soft steel bars, 3.57½c.; structural material, 3.67½c.; tank plates, 3.87½c.; No. 10 blue annealed sheets, 4.77½c.; No. 28 black sheets, cold rolled, one pass, 5.85c.; No. 28 galvanized sheets, black sheet gage, 7.20c.

Old Material.—The scrap market shows no activity whatever, even the dealers being out of the field either to buy or sell. Under present conditions none of the consuming interests are taking any part in the movement of material and all hold off from transactions. As a result of there being no needs to fill, the only railroad list out is one from the Cotton Belt of about 800 tons, which is being taken at rather low prices by one or two of the big dealers to lay down in their yards or against existing contracts.

We quote dealers' prices f.o.b. consumers' works, St. Louis industrial district, as follows:

Per Gross Ton	
Old iron rails	$18.00 to $18.50
Old steel rails, rerolling	15.00 to 15.50
Old steel rails, less than 3 ft	14.50 to 15.00
Relaying rails, standard section, subject to inspection	35.00 to 40.00
Old car wheels	19.50 to 20.00
No. 1 railroad heavy melting steel	13.50 to 14.00
Heavy shoveling steel	12.00 to 12.50
Ordinary shoveling steel	11.00 to 11.50
Frogs, switches and guards cut apart	13.50 to 14.00
Ordinary bundled sheet	6.00 to 6.50
Per Net Ton	
Heavy axle and tire turnings	7.00 to 7.50
Iron angle bars	17.00 to 17.50
Steel angle bars	12.00 to 12.50
Iron car axles	29.00 to 29.50
Steel car axles	16.50 to 17.00
Wrought arch bars and transoms	17.00 to 17.50
No. 1 railroad wrought	12.00 to 12.50
No. 2 railroad wrought	12.00 to 12.50
Railroad springs	12.00 to 12.50
Steel couplers and knuckles	12.00 to 12.50
Locomotive tires, 42 inches and over, smooth inside	10.00 to 10.50
No. 1 dealers' forge	9.00 to 9.50
Cast iron borings	7.50 to 8.00
No. 1 busheling	12.00 to 12.50
No. 1 boilers, cut to sheets and rings	8.00 to 8.50
No. 1 railroad cast	17.00 to 17.50
Stove plate and light cast	15.00 to 15.50
Railroad malleable	12.00 to 12.50
Agricultural malleable	12.00 to 12.50
Pipes and flues	10.00 to 10.50
Railroad sheet and tank	8.00 to 8.50
Railroad grate bars	12.00 to 12.50
Machine shop turnings	5.00 to 5.50
Country mixed	9.00 to 9.50
Uncut railroad mixed	10.00 to 10.50
Horseshoes	15.00 to 15.50
Railroad brake shoes	11.00 to 11.50

Cleveland

CLEVELAND, March 1.

Iron Ore.—The Interstate Commerce Commission has refused to grant the application of the Lake Superior ore mining companies, filed by the Lake Superior Ore Association, asking the suspension of the new ore tariffs filed recently by the Michigan and Wisconsin railroads that haul old range ores. This refusal was unexpected by the ore people. As a result the season of navigation will open with a $1 ore-carrying rate to Ashland and Escanaba, an advance of 15c. a ton, and 75c. and 85c. rates to Marquette, an advance of 10c. over last season's rates. The hearing on the application of the ore mining companies that all the rail rates for carrying ore from the Lake Superior district to the upper lake ports be reduced on the ground that they are excessive, which was set for March 12, has been postponed indefinitely on request of the railroads that asked for further time to prepare their data. Consequently, the prospects are not bright of getting a decision in either rate case before late in the shipping season. When the Interstate Commerce Commission takes up the consideration of the old range rate case the ore shippers will have the disadvantage of attempting to secure the reduction of a rate already in effect rather than trying to prevent a rate increase. Based on the ore movement last year receipts of the old range railroads on ore would show an increase of $2,672,000 for the season. While the old range railroads expect the increase in ore rates will increase their income from this source the higher rail rates will work to the disadvantage of the old range ores as compared with the Mesabi ores, and the opinion is expressed that the increase in the old range rates may divert ore sales away from the old range mines to such an extent that the receipts for carrying ore from the old ranges would show a falling off instead of an increase, unless the mining companies in the old ranges absorb the increase in carrying charges by making no change in the present differentials between old range and Mesabi ores when ore prices are established for the coming season.

We quote delivered lower lake ports: Old range Bessemer, $7.45; old range non-Bessemer, $6.70; Mesabi Bessemer, $7.20; Mesabi non-Bessemer, $6.55.

Pig Iron.—The market shows a little more life in small lot sales, mostly in foundry iron. A Barberton, Ohio, foundry has purchased 500 tons of prompt shipment malleable iron at under $27. It is understood this sale was made by a broker. The recent inquiry from the American Radiator Co. for 1000 tons of No. 3 foundry iron for its Detroit plant brought out a price of $28, Detroit, which did not take the business. This company is understood to have purchased several lots of resale iron in Detroit at considerably lower prices. While resale iron appears to have been about cleaned up in this territory, it still seems to be plentiful in Detroit. A resale lot of 200 tons of high silicon foundry iron has been purchased by an Ohio consumer at $25 base, Detroit. One furnace interest reports sales aggregating over 600 tons of foundry iron during the week and a few other sales in lots up to 100 tons have been made. Some foundries are buying prompt shipment iron to mix with their high-priced iron in order to reduce the average cost. The market is apparently settling down to a $27 basis for foundry iron, but some of the sales during the week were made at $27.50 and $28. However, one Cleveland interest has not yet reduced its price from $29 for foundry iron. The Columbus foundry which inquired for 1000 tons of malleable iron has not yet placed this business and is holding out for a $25 price. Shipments from furnaces during February showed a slight gain over January. A survey of foundry operations made by one interest among its trade in Ohio, Michigan and Pennsylvania, showed the average operation of gray iron and malleable foundries to be about 23 per cent. The Hanna Furnace Co. has banked its "B" furnace in Buffalo and now has only one furnace, the Cherry Valley stack at Leetonia, in operation.

We quote delivered Cleveland as follows, based on the new freight rates, these being a 56c. switching charge for local iron, a $1.96 freight rate from Valley points, a $3.36 rate from Jackson and $6.67 from Birmingham:

Basic	$26.96
Northern No. 2 fdy., sil. 1.75 to 2.25	$27.56 to $28.56
Southern fdy., sil. 2.25 to 2.75	34.42 to 35.42
Ohio silvery, sil. 8 per cent	46.86
Standard low phos., Valley furnace	43.00

Finished Iron and Steel.—The volume of business is still light and consequently those who expected that lower prices would stimulate business are disappointed. While price reductions have evidently resulted in some increase in orders, they have not brought out desirable tonnages. Some of the mill agencies are getting a little better volume of inquiries, but these for the most part are from jobbers and fabricators for carlots in assorted sizes. Very little business is coming from manufacturing plants. Prices still show a tendency toward lower levels for desirable orders. Plates and structural material are now freely quoted at 2.15c., although some independent mills are adhering to 2.25c. for these materials. However, the plate market is particularly weak and there are persistent reports that a buyer can find a 2c. price for round tonnage of plates. An inquiry has come out for 1000 tons of plates for Government tank work. The usual minimum quotation on steel bars is 2.10c. However, an inquiry for 450 tons of soft steel reinforcing bars for the City Hospital, Cleveland, has brought out a price of 2.50c., including all extras and delivery to the building site. This figures back to a base price of 1.90c. to 2c., Pittsburgh. Some of the independent mills are quoting a rather wide range of prices naming only minimum quotations on desirable orders. The only new inquiries in the structural

field are for 340 tons of steel for two high school buildings in Cleveland and for 1300 tons for a bascule lift bridge in Detroit. The Santa Fe Railroad is inquiring for 50 locomotives. An export inquiry has appeared for 2000 tons of sheet bars and billets. Nails are still to be had at $3 per keg base.

Cleveland warehouses quote steel bars at 3.30c. to 3.34c.; plates, 3.60c. to 3.64c., and structural material, 3.40c. to 3.44c.; No. 9 galvanized wire, 4.70c.; No. 9 annealed wire, 3.75c.; No. 28 black sheets, 5.25c.; No. 28 galvanized, 6.50c.; No. 10 blue annealed, 4.30c.

Warehouse Business.—Warehouse prices on sheets have been reduced $5 a ton on blue annealed, $7 on black and $9 on galvanized. Other warehouse prices are unchanged, but are irregular owing to shading by some jobbers. A warehouse quotation of 2.70c. has appeared on small angles including extras.

Sheets.—New demand for sheets is light and minimum prices on all grades have further declined $2 or more. A local mill has gone to 4c. on black sheets, quotations on this grade ranging from that price to 4.20c. Blue annealed sheets are quoted down to 3.15c. and galvanized as low as 5.15c. Some mills are asking $2 to $4 a ton above these minimum prices, but the market is weak and it is believed that a good inquiry would bring out a 3c. price on blue annealed sheets. Plate mills are adhering to 2.70c. on light plates in blue annealed gages.

Coke.—The coke market is inactive with prices on standard Connellsville foundry coke for prompt shipment unchanged at $6 to $7 per net ton.

Bolts, Nuts and Rivets.—Bolt and nut manufacturers report a slight improvement in the number of small orders, but the aggregate business is light. Consumers are buying only for immediate needs. The market is not firm, but no order has come out recently that was large enough to bring out more than a slight concession in prices. Rivet makers are getting some specifications on contracts but practically no new business. Rivet prices are being shaded at least $1 a ton.

Old Material.—The scrap market continues almost at a standstill. No sales whatever are being made to mills and shipments are limited to an occasional carlot on old orders. Most dealers have scrap under contract to fill their orders. The production of scrap is at a low ebb owing to the limited operation of manufacturing plants and, consequently, little material is coming on the market except railroad scrap. We note the sale of a small lot of bolts and nut punchings at $15.25 gross by a local producer. Quotations on all grades are unchanged.

Per Gross Ton

Heavy melting steel	$14.00 to $14.25
Steel rails, under 3 ft	17.00 to 17.50
Steel rails, rerolling	17.00 to 18.00
Iron rails	17.00 to 17.50
Iron car axles	33.00 to 35.00
Low phos. melting	16.50 to 17.00
Cast borings	11.00 to 11.50
Machine shop turnings	6.00 to 7.00
Mixed borings and short turnings	10.00 to 10.50
Short turnings for blast furnaces	10.00 to 10.50
Compressed steel	10.00 to 11.00
Railroad wrought	15.50 to 16.00
Railroad malleable	16.00 to 16.50
Steel axle turnings	11.00 to 11.50
Light bundled sheet stampings	6.00 to 7.00
Drop forge flashings over 10 in	8.00 to 9.00
Drop forge flashings under 10 in	9.00 to 10.00
No. 1 cast	20.00 to 21.00
No. 1 busheling	9.00 to 10.00
Railroad grate bars	15.00 to 16.00
Stove plate	15.00 to 16.00
Cast iron car wheels	19.00 to 20.00
Pipes and flues	9.00 to 9.50

An important deal in lake shipping circles has just been concluded in Cleveland. This is the taking over of all the vessels of the Richardson fleet, 11 in number, by the recently organized Columbia Steamship Co., which is affiliated with Oglebay, Norton & Co., ore shippers. Crispin Oglebay, D. Z. Norton and R. N. Case of Oglebay, Norton & Co., are respectively president, vice-president and treasurer of the steamship company. Clarence E. Richardson is secretary and John T. Kelly continues as fleet manager. Oglebay, Norton & Co. will move March 14 to the new Hanna Building, where the two companies will occupy joint offices.

Boston

BOSTON, March 1.

Pig Iron.—Less pig iron was sold in New England during the past week than has been the case before in any similar period since the present business depression set in. One local house reports a sale of 350 tons of special analysis iron to a Massachusetts consumer at private terms and 50 tons of resale Buffalo, silicon 2.25 to 2.75, to another Massachusetts consumer on a basis of about $25.50 furnace. The second buyer also took an additional 50 tons eastern Pennsylvania No. 1X iron from another seller at $31.56, delivered, which, with the freight and $1 differentials allowed, figures $25.50 furnace, base. Another local house reports six tons iron sold, and another a car of resale Buffalo No. 2X at $30 on cars Rhode Island, which figures out about $25 furnace. No other sales are reported. There are, however, a number of small inquiries in the market, mostly for car lots, which probably will develop within the next week or two. Resale iron is more plentiful due to an offering of approximately 2000 tons eastern Pennsylvania and Buffalo by a Providence, R. I., melter. Activity among the New England foundries has not increased, although perhaps in certain spots it is better. Conservative estimates place the average activity of foundries in general at between 15 and 20 per cent of normal. Delivered pig iron prices follow:

East. Penn., silicon 2.25 to 2.75	$31.06 to $35.31
East. Penn., silicon 1.75 to 2.25	30.06 to 34.06
Buffalo, silicon 2.25 to 2.75	32.46 to 36.71
Buffalo, silicon 1.75 to 2.25	31.46 to 35.46
Virginia, silicon 2.25 to 2.75	35.83 to 40.83
Virginia, silicon 1.75 to 2.25	34.58 to 39.58
Alabama, silicon 2.25 to 2.75	39.41 to 41.91
Alabama, silicon 1.75 to 2.25	38.16 to 40.66

Coke.—The New England Coal & Coke Co., which has been quoting spot foundry coke at $13.60 a ton delivered, where the freight rate does not exceed $3.40, is now meeting competitive prices when necessary, but during the past week did not quote below $12.85 delivered. The Providence Gas Co. has been doing a fairly good spot business at $12.85 delivered, and a few scattering cars of Connellsville good grade foundry sold on a basis of $6 f.o.b. ovens. The consumption of foundry coke in this section of the country is far below normal and stocks, as a rule, are large in foundry yards.

Finished Material.—Business continues of limited proportions, according to mill representatives, jobbers and large consumers evidently not being interested in finished material at any price. It is rumored some tonnages of bars and structural shapes have been booked at $2 f.o.b. Pittsburgh, but such reports cannot be substantiated. Such materials are available, however, at $2.15. The Boston Structural Steel Co., Inc., Cambridge, Mass., has been awarded about 1000 tons of shapes for two New Bedford, Mass., schools, and 250 tons for a municipal building, Hyde Park, Boston. Paul Chapman, New York, is awarded the steel for a four-story, 240 x 216 x 220 ft. Bridgeport, Conn., building. Galvanized sheets generally are offered at $5.45 f.o.b. Pittsburgh, but as low as $5.25 has been named, and blue annealed are available at $3.30. Local jobbers report no improvement in business. Prices quoted by them are steadier, less cutting on bolts, nuts, etc., being noticeable.

Jobbers now quote: Soft steel bars, $3.63 per 100 lb. base; flats, $4.50 to $4.85; concrete bars, $3.63 to $3.75; tire steel, $5 to $5.50; spring steel, open hearth, $6.50; crucible, $12; steel bands, $4.33 to $5.25; steel hoops, $5; toe calk steel, $7; cold rolled steel, $5.25 to $6; structural, $3.63 to $4.25; plates, $3.93 to $4.32; No. 10 blue annealed sheets, $5.20; No. 28 black sheets, $6.05; No. 28 galvanized sheets, $7.40; refined iron, $3.75 to $5.50; best refined, $5.50; Wayne, $8.50; band iron, $4.58; hoop iron, $5; Norway, $12.

Old Material.—The Sullivan Machinery Corporation, Claremont, N. H., last week inquired on 100 tons No. 1 machinery cast, but to date has not placed the order. The cast market otherwise is without special feature, except, perhaps, that foundries and dealers are more willing to sell material. The demand, however, is decidedly limited, and melters are evidently not interested in stove plate at any price. Prices of cast are a shade easier due to the attitude of holders. Eastern Pennsylvania mills have taken small tonnages

of No. 1 heavy melting steel at $13.50 to $14 delivered, and wrought pipe at $15.50 delivered, and machine shop turnings at $7 on cars at Boston. Purchasers are limited by the fact that dealers will not sell more than 100 tons at a time. Local yard prices on old material follow:

No. 1 heavy melting steel	$8.50 to	$9.00
No. 1 railroad wrought	15.00 to	16.00
No. 1 yard wrought	12.00 to	13.00
Wrought pipe (1 in. in diameter, over 2 ft. long)	10.00 to	10.50
Machine shop turnings	7.00 to	7.50
Cast iron borings, rolling mills	7.00 to	8.00
Cast iron borings, chemical	9.00 to	10.00
Heavy axle turnings	8.00 to	8.50
Blast furnace borings and turnings	4.50 to	5.00
Forged scrap and bundled skeleton	7.00 to	7.50
Street car axles, steel	19.00 to	20.00
Car wheels	20.00 to	21.00
No. 1 machinery cast	19.50 to	20.00
No. 2 cast	17.50 to	18.00
Stove plate	15.00 to	15.50
Railroad malleable	15.00 to	15.50
Rerolling rails	12.00 to	13.00

Cincinnati

CINCINNATI, March 1.

Pig Iron.—With the exception of 600 tons of malleable from a Chattanooga melter, the market is almost devoid of inquiries. Even carload business has fallen off within the past 10 days. Prices are slightly lower. In the Southern market, $27.50 remains the usual minimum, but on a round tonnage one interest at least has quoted $26.50. Offers by buyers for small lots at $25, Birmingham, have not received much consideration from furnaces, though this price might be made on a substantial tonnage. In the North, $26, Valley, has been done on iron shipped into this territory, and some southern Ohio iron has been sold on a $28, Ironton basis. It is reported that one southern Ohio furnace has sold 150 tons of high silicon iron on a basis of $30, delivered, the silicon differential being waived. While Jackson County silvery makers continue to hold to the $43.50 schedule, resale material, coming principally from Detroit district, can still be had at $5 under this price. A central Ohio foundry is reported to have purchased 500 tons of malleable from a Valley stack at slightly under $25 at the furnace. At least part of the tonnage inquired for by the American Radiator Co. for its Detroit plant has been purchased, 500 tons of resale iron having been purchased at a price under $27.

Based on freight rates of $4.50 from Birmingham and $2.52 from Ironton, we quote f.o.b. Cincinnati:

Southern coke, sil. 1.75 to 2.25 (base)	$31.00 to $32.00
Southern coke, sil. 2.25 to 2.75 (No. 2 soft)	32.25 to 33.25
Ohio silvery, 8 per cent sil	42.52
Southern Ohio coke, sil. 1.75 to 2.25 (No. 2)	30.52
Basic northern	28.52
Malleable	31.02

Finished Material.—A slight improvement is noted in the demand for finished materials. No heavy tonnages are being booked, orders in nearly all cases being confined to carload lots for immediate delivery. Uncertainty as to the future trend of prices is said to be keeping some prospective large buyers out of the market for the present. While rumors continue to be heard of very low prices, there is no disposition on the part of the mills to quote prices on the tonnages offering. Sales being put through are generally on a basis of 2.25c. for bars and shapes and 2.40c. for plates in carload lots. It is generally conceded that on a 500-ton bar inquiry a quotation of 2c. would be secured, and possibly 1.90c. could be done. On wire products, Ironton mills continue to quote $3.25, base, per keg, Ironton basis, but it is now reported that a Pittsburgh district mill has met this price, and will quote $3 on a Pittsburgh basis. On sheets the majority of the orders placed are for carload and less than carload lots, and on these 4.20c. for black and 5.40c. for galvanized are the prevailing prices. On desirable tonnages these prices would not stand. The structural field is showing some activity. Bids are being asked for the construction of a merchants and manufacturers' building at the Kentucky Fair Grounds at Louisville, involving 400 tons, and the Louisville & Nashville Railroad is expected to call for bids for the construction of a round house at one of its terminals. An addition to the Lincoln Hotel at Indianapolis is expected to be up shortly, and the Third National Bank, Dayton, Ohio, is contemplating the erection of a 14-story building in that city, costing approximately $1,500,000. The American Bridge Co. will fabricate a bridge span for the Louisville & Nashville Railroad. Plant operations in this district have shown no appreciable change in the past week. The Whitaker-Glessner mills are reported to be operating at about 40 per cent of capacity, and the American Rolling Mill Co. at about the same rate. The Andrews Steel Co. and the Newport Rolling Mill Co. are closed down, and the Buckeye Steel Castings Co., Columbus, is operating one furnace.

Warehouse Business.—Slight improvement in warehouse business is reported. Local jobbers have reduced prices on wire nails, from $4 per keg, base, to $3.75 per keg, base. This is the only price change recorded since the first of the year, though it is reported that should steel decline further local warehouses will revise quotations to meet the conditions.

Iron and steel bars, 3.58c. base; shapes, 3.68c. base; hoops and bands, 3/16 in. and lighter, 4.28c.; plates, 3.88c. base; reinforcing bars, 3.65c.; cold-rolled rounds, 1½ in. and over, 5.20c.; under 1½ in. rounds, flats, squares and hexagons, 5.70c.; No. 10 blue annealed sheets, 4.78c. base; 28-gage black sheets, 6c. base; 28-gage galvanized sheets, 7c. base; wire nails, $3.75 per keg, base.

Coke.—The coke market is slightly softer. Connelsville furnace coke is quoted at $4.50 to $5, and foundry from $5 to $6. Wise County furnace is quoted at $6.50 and foundry from $7.50 to $8. New River foundry coke is now available at $10, one dollar under last week's quotations.

Old Material.—Very little activity is noted in the scrap market. Cast borings, heavy melting steel and steel rails for melting are off $1 on light transactions, and in one instance a dealer during the week offered machinery cast at $16, delivered.

We quote dealers' buying prices:

Per Gross Ton		
Bundled sheets	$7.50 to	$8.50
Old iron rails	16.50 to	17.50
Relaying rails, 50 lb. and up	40.50 to	41.50
Rerolling steel rails	12.50 to	13.50
Heavy melting steel	10.50 to	11.50
Steel rails for melting	10.50 to	11.50
Car wheels	16.50 to	17.50
Per Net Ton		
No. 1 railroad wrought	11.50 to	12.50
Cast borings	5.50 to	6.00
Steel turnings	4.00 to	4.50
Railroad cast	15.50 to	16.50
No. 1 machinery	15.50 to	16.50
Burnt scrap	8.50 to	9.50
Iron axles	23.00 to	23.50
Locomotive tires (smooth inside)	11.00 to	12.00
Pipes and flues	7.50 to	8.00
Malleable cast	10.50 to	11.00
Railroad tank and sheet	6.50 to	7.00

Philadelphia

PHILADELPHIA, March 1.

Continued stagnation in all branches of the market and further weaknes in prices characterize the situation to-day. The attitude of the Steel Corporation on prices is of foremost interest among both buyers and sellers. A firm conviction prevails that the leading interest will reduce its scale of prices within the near future, even though Judge Gary's announcements have apparently discouraged such an expectation. Meanwhile, the independent steel companies are out with offers of such low prices that any reduction by the Steel Corporation to-day, to get below the independents' prices, must be from $10 to $15 a ton. A Youngstown mill has quoted 1.90c., Pittsburgh, on steel bars, which is $9 below the corporation's price; while on plates 2.10c., Pittsburgh, has been done, which is $11 below the corporation's price. Wire nails have been sold at 3c., base, Pittsburgh, which is $5 a ton below the leading interest's price, and on sheets such low prices are reported as 3c. on No. 10 blue annealed, 4c. on No. 28 black and 5c. on No. 28 galvanized, all f.o.b. Pittsburgh, these prices being $11, $7 and $14, respectively, below the prices still named by the American Sheet & Tin Plate Co. Low prices on steel are being made in some instances with a great deal of secrecy because of the difficulty in finding a consumer who really has an order to place.

In pig iron there is pronounced dullness with prices down nearly $2 a ton in the week. Old material is very weak, with prices lower.

Pig Iron.—A further decline in pig iron prices has occurred with the week on a limited number of small transactions. Competition is keen among the few furnaces still in blast, which are willing to take a loss on current tonnage to avoid, if possible, the necessity of blowing out. Even with the limited production of merchant iron in the Eastern district, nearly all of the stacks in blast are piling iron. Pioneers in the pig iron trade here say that the total volume of iron being sold is the lowest within their recollection. One Eastern furnace has sent out circular letters to some of its customers announcing a price of $26.50 on No. 2 plain and gray forge, while $27.50, furnace, has been done by another furnace on 350 tons of No. 2X. No sales of basic are reported, but $26, furnace, could be quite easily done, and on 4000 or 5000 tons it is almost certain that a buyer would be able to find a quotation of $25, furnace. A steel maker in this district offered $25, delivered, for basic, but apparently no furnace was ready as yet to accept this price, which would have meant a furnace price of about $23.50. Low phosphorus iron remains at $41.50, furnace, for copper free, and $40, furnace, for copper bearing. Malleable is quoted at $29.50, furnace; no sales reported. The trade is in a quandary as to the future course of the market, but buyers evidently expect still lower prices. The Westinghouse Electric & Mfg. Co., South Philadelphia, came into the market for 600 tons of foundry iron, and finally bought only 100 tons, announcing that it would await lower prices before purchasing the remainder.

The following quotations are for iron delivered in consumers' yards in Philadelphia or vicinity, except those for low phosphorus iron, which are f.o.b. furnace:

East. Pa. No. 2 plain, 1.75 to 2.25	$27.14 to $27.76
East. Pa. No. 2X, 2.25 to 2.75 sil.	28.34 to 28.76
Virginia No. 2 plain, 1.75 to 2.25 sil.	33.74 to 35.74
Virginia No. 2X, 2.25 to 2.75 sil.	34.99 to 36.99
Basic deliv. Eastern Pa.	27.26
Gray forge	27.76
Standard low phos. (f.o.b. furnace)	41.50
Malleable	30.90
Copper bearing low phos. (f.o.b. furnace)	40.00

Ferroalloys.—The market is dull, with quoted prices for ferromanganese ranging from $90 to $100, delivered. Spiegeleisen is to be had at $35, furnace.

Semi-Finished Steel.—There is no demand in this market for billets and the quotations of Eastern mills remain nominally at $43.50 for rerolling quality and $48.50 for forging quality, f.o.b. Pittsburgh.

Plates.—So little demand exists for plates that the market is not being tested as to prices. It is reported that one buyer has received a quotation of 2.25c., Philadelphia, which would be equivalent to 1.90c., Pittsburgh. This delivered price would net an Eastern mill more than 2c., mill. Most of the current sales range for 2.10c. to 2.25c, Pittsburgh, but the lower price is now appearing more frequently.

Structural Material.—An improvement in the bookings of small orders is noted, but the market is barren of large projects. Plain material is now to be had at 2.10c., Pittsburgh, but some sales are being made up to 2.25c.

Bars.—Orders for steel bars are extremely scarce. A Youngstown mill has quoted 1.90c., Pittsburgh, for shipment to this district. Sales have been made at 2c. and at 2.10c., Pittsburgh, the latter price ruling on the majority of current sales, which are of such small tonnage that the mills are not encouraged to cut too deeply for the business. Bar iron nominally remains at 2.35c., Pittsburgh, but Eastern makers would undoubtedly accept firm offers at lower prices.

Wire Products.—Wire nails and plain wire have been sold at 3c., base, Pittsburgh. Cut nails are now offered by an Eastern maker at 4c., Pittsburgh, for carloads and 4.25c. for less than carloads.

Light Rails.—A seller of light rails states that it has not been necessary to cut below 2.25c., Pittsburgh, to obtain current small-lot business.

Wrought Pipe.—The Reading Iron Co. has announced a reduction of $8 to $10 a ton on wrought iron pipe, effective March 1. New discounts are printed on page 604.

Sheets.—Some very low prices have been named on sheets, but it is difficult to learn of specific transactions. On blue annealed sheets, 3c., base, has been quoted; 4c. has been quoted on No. 28 black, and 5c. on No. 28 galvanized, all f.o.b. Pittsburgh, but at the same time sales have been made at prices a few dollars a ton above these minimum quotations.

Old Material.—Prices on scrap are now so low that, with the present high freight rates, dealers are not interested in orders, the profits being so small. One steel plant is offering $13.50 for No. 1 heavy melting steel and another offers $14, and both have received a few carloads at these prices. All grades of scrap are off in price, and the market is simply waiting for a revival in activity among steel plants, foundries and rolling mills. Bids will go in to-day on 110,000 tons of plates and shapes and other steel at the Hog Island shipyard. This steel has little, if any, reclamation value other than as scrap, it is stated. We quote the following prices for delivery at consuming points in this district:

No. 1 heavy melting steel	$13.50 to $14.00
Steel rails, rerolling	18.00 to 19.00
No. 1 low phos., heavy 0.04 and under	22.50 to 23.50
Car wheels	20.00 to 21.00
No. 1 railroad wrought	18.00 to 19.00
No. 1 yard wrought	16.00 to 18.00
No. 1 forge fire	12.50 to 13.00
Bundled skeleton	12.50 to 13.00
No. 1 busheling	15.00 to 16.00
No. 2 busheling	11.00 to 12.00
Turnings (short shoveling grade for blast furnace use)	8.50 to 9.50
Mixed borings and turnings (for blast furnace use)	8.50 to 9.50
Machine-shop turnings (for rolling mill and steel works use)	11.00 to 11.50
Heavy axle turnings (or equivalent)	12.00 to 13.00
Cast borings (for rolling mills)	12.00 to 13.00
Cast borings (for chemical plants)	14.00 to 15.00
No. 1 cast	22.00 to 23.00
Railroad grate bars	16.00 to 16.50
Stove plate (for steel plant use)	16.00 to 16.50
Railroad malleable	16.00 to 17.00
Wrought iron and soft steel pipes and tubes (new specifications)	14.50 to 15.50
Iron car axles	30.00 to 31.00
Steel car axles	25.00 to 26.00

German Advantage Over French Industry

LIVERPOOL, ENGLAND, Feb. 10.—The position of the French steel and iron trade is not nearly so good as appears on the surface. The wages of a skilled worker in Germany are about 40 marks per day, equivalent to about 8½ francs. The French worker receives on the average 20 francs per day, so that the wages bill alone in France, taking the output per man as being similar, is about 2½ times that of Germany. Further, Germany has an excess of coal over her iron-making requirements, consequently coke, which in Germany costs the equivalent of 65 francs, cost 175 francs in France per ton. Altogether, taking everything into consideration, it costs France about 450 francs per ton more than it costs Germany. The result of all this is that Germany's steel and iron manufacturers in the shape of rails, girders, angles, plates and structural requirements are being offered in France at prices against which French manufacturers cannot compete.

France has recently been buying coal abroad on a large scale, offering high prices for immediate deliveries. This course was adopted in view of the German attitude in connection with the reparation clauses of the Spa agreement. France encouraged her import firms to purchase all the coal they could get, and the government entered into large contracts with both England and the United States. Altogether from 12 to 15 million tons were ordered, a good deal of which has already been delivered, at high prices. Immediately this was done Germany delivered all the coal demanded under the reparation clauses, with the result that coal for the time being is almost a drug in the market. The government itself is now offering coal at 24s. reduction and a few days ago 6000 tons of American coal which arrived at Havre were auctioned off at 23s. per ton. Collieries are being forced to dismiss men and to cut down production; railways are suffering, and the coal trade is faced with a financial crisis merely as a result of German duplicity.

GERMAN MARKET

Falling Demand and Lower Prices Expected on March 1

BERLIN, GERMANY, Jan. 31.—The iron market remains under the influence of the world-wide reaction now in progress. This has given strength to the expectations of consumers that a lower scale of prices will be adopted in Germany for March 1. This situation has necessarily kept buying upon a very restricted basis. From most sections of the market, therefore, a reserved or even weak tone is reported. The reductions of prices in England, Belgium and France, together with the decline of production in the United States, are duly taken account of here and are having a depressing effect.

Weakening Ore and Scrap Markets

The changing situation of the market is reflected in heavier and more urgent offerings of ores and equally in the hesitation of furnace owners to add to their stocks. It is added that they are already well supplied with ore, whereas sellers are fairly falling over themselves with offers of new material. This applies particularly to Spanish and Moroccan ores. There are also heavy offers of Swedish ores, despite the fact that the Gulf of Bothnia is now closed by ice. Swedish concentrates running 60 per cent iron now command 28 crowns at port of shipment, whereas the price about two months ago was 31 to 32 crowns. Minette ores are also offered in large amounts, while the demand has declined. Their price has recently fallen from 16 to 14 francs. German works have in hand ore stocks for about two months.

The supplies of old iron and scrap material have latterly been increased greatly through the sale by the Entente Commission at Berlin of large lots of Belgian, Russian and Japanese war material as junk. The whole lot, amounting to some 40,000,000 marks, was taken by a Berlin firm. The price of old material has recently fallen again. About ten days ago the best old steel material fell to 900 marks, and the tendency has continued downward.

It is probable that this movement will continue in view of the situation on the ore market. This is all the more to be expected since the heavier and cheaper offerings of ores are due chiefly to the drop in ocean freights, which will probably go even lower. Reports describe the ocean freight market as in a state of demoralization.

Pig Iron Active, But Steel Receding

Shipments of steel products this month have declined, whereas the movement in pig iron has been the largest for several years. Dealers in steel show a willingness to make price concessions. Producers are in part carrying their output to stock. Nevertheless it is said that the mills for the most part have orders that will keep them employed for about three months. The Upper Silesian district cannot fully employ its producing capacity, and it is not expected that any improvement can occur there till after the plebiscite, which is now fixed for March 13. Demand has been declining there, and even some cancelling of orders is mentioned. The export demand there is unsatisfactory, and there is no prospect that it will improve. However, blast furnaces are busy and the demand for pig iron remains heavy.

A report on the Ruhr market mentions such an active demand for semi-finished steel that it could not be fully met, and only small amounts were left over for export; but this report is of a more optimistic color than others. A larger demand for rails is also claimed. For structural steel a more favorable outlook is declared to exist, due to increasing building operations. The hardware trade is expecting considerable American orders. There is a better demand for plates and tubing, but bars are dull.

Falling Demand for Castings

The Foundry Association has issued a market survey saying that the makers of commercial castings were not able to keep their shops fully employed, and a goodly number were carrying their product to stock. A further deterioration of the market for machine castings is mentioned, and orders are described as light with most of the shops. Foundries in the West complain of a shortage of suitable coke, as well as pig iron. From some of the South German foundries a better trade is mentioned in castings for agricultural machinery, due partly to increased demand for export.

The prices for the new list to take effect March 1 are already the subject of negotiation, and action will probably be taken within a fortnight. Further reductions are looked for, although some of the manufacturers claim that prices are, for them, not much above the costs of production. The fact that steel material is now in some cases offered 200 to 300 marks below list prices seems to make a general reduction certain. As mentioned above, the situation in other countries is tending strongly to convince the Germans of the necessity to adopt lower rates. The Belgian situation in particular is described as very bad. Out of 52 blast furnaces there only 27 are in blast; the rest are idle or undergoing repairs.

The Coal Situation

Coal producers, on the other hand, are trying to put through an increased price scale. The Association has just adopted a new list, with an increase of 25 marks in the Ruhr region; but the representative of the Ministry of Economy protested against the advance, and it is doubtful whether it will be sanctioned. The government takes the position that market conditions do not warrant raising coal prices. Both labor and manufacturing interests, it holds, would be injured; moreover, the general business situation in the world's markets is regarded as not justifying higher coal prices in Germany. Meanwhile the scarcity of coal remains acute. A few days ago Krupps issued a statement to its workmen, foreshadowing a partial shutdown of some sections of its mills, unless economies in coal can be carried through. This statement is all the more noteworthy in view of the fact that this great firm is just now raising a loan of 250 million marks, largely for the purpose of annexing several big coal properties.

Germany's coal production last year is now stated at 131,346,000 tons, as against 107,690,000 tons for 1919 and 158,186,000 tons for 1918. The production of lignite last year broke all previous records, reaching 111,633,000 tons, compared with 93,843,000 tons for 1919 and 100,662,000 tons for 1918. In 1913 Germany produced only 87,116,000 tons of lignite. The increase since then is 28 per cent.

The German electrical companies have reduced machinery prices by 10 per cent.

Ownership Changes

The Rheinische Stahlwerke and the Arenberg Coal Co. have adopted a community of interest arrangement for ten years, with provisions for the gradual absorption of the coal mine by "Rhein-Stahl." This mine has long been one of the best dividend-payers among all German coal mines.

The Mannesmann Roehrenwerke of Düsseldorf has acquired a large part of the shares of the Freistädter Stahl und Eisenwerke at Friestadt in Czecho-Slovakia. The Rombacher Hüttenwerke, mentioned recently in this correspondence as having acquired the Concordia coal mine, will erect a nickel and steel works in connection with the latter property.

It is reported that French financiers, backed by several strong Paris banks, are acquiring shares in Upper Silesian coal and iron companies. The works there are in great need of capital; but they are taking care not to allow the French to get control of the majority of their stock. It is said that French participation is not to go above 15 per cent.

The foundry department of the Allegheny Steel Co., Brackenridge, Pa., resumed operations Feb. 21, following a suspension of eight weeks.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

Freight Rates

Freight rates from Pittsburgh on finished iron and steel products, in carload lots, to points named, per 100 lb., are as follows:

Philadelphia	$0.35	St. Paul	$0.695
Baltimore	0.335	Omaha	0.815
New York	0.38	Omaha (pipe)	0.78
Boston	0.415	Denver	1.35
Buffalo	0.295	Denver (wire products)	1.415
Cleveland	0.24	Pacific Coast	1.665
Cincinnati	0.33	Pacific Coast, ship plates	1.335
Indianapolis	0.345	Birmingham	0.765
Chicago	0.38	Jacksonville, all rail	0.555
St. Louis	0.475	Jacksonville, rail and water	0.46
Kansas City	0.815	New Orleans	0.515
Kansas City (pipe)	0.78		

The minimum carload to most of the foregoing points is 36,000 lb. To Denver the minimum loading is 40,000 lb., while to the Pacific Coast on all iron and steel products, except structural material, the minimum is 80,000 lb. On the latter item the rate applies to a minimum of 50,000 lb., and there is an extra charge of 9c. per 100 lb. on carloads of a minimum of 40,000 lb. On shipments of wrought iron and steel pipe to Kansas City, St. Paul, Omaha and Denver, the minimum carload is 46,000 lb. On iron and steel items not noted above the rates vary somewhat and are given in detail in the regular railroad tariffs.

Rates from Atlantic Coast ports (i.e., New York, Philadelphia and Baltimore) to Pacific Coast ports of call on most steamship lines, via the Panama Canal, are as follows: Pig iron, 55c.; ship plates, 70c.; ingot and muck bars, structural steel, common wire products, including cut or wire nails, spikes and wire hoops, 75c.; sheets and tin plate, 60c. to 75c.; rods, wire rope, cable and strands, $1; wire fencing, netting and stretcher, $1.20; pipe, not over 8 in. in diameter, 85c.; over 8 in. in diameter, 2½c. per in. or fraction thereof additional. All prices per 100 lb. in carload lots, minimum 40,000 lb.

Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in.; angles, 3 to 6 in., on one or both legs, ¼ in. thick and over, and zees, structural sizes, 2c. to 2.45c.

Wire Products

Wire nails, $3.10 to $3.25 base per keg; galvanized, 1 in. and longer, including large-head barbed roofing nails, taking an advance over this price of $1.50 and shorter than 1 in., $2; bright Bessemer and basic wire, $3.00 to $3.25 per 100 lb.; annealed fence wire, Nos. 6 to 9, $3.00 to $3.25; galvanized wire, $3.70 to $3.95; galvanized barbed wire, $3.85 to $4.10; galvanized fence staples, $3.85 to $4.10; painted barbed wire, $3.15 to $3.40; polished fence staples, $3.15 to $3.40; cement-coated nails, per count keg, $2.85; these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days, net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 58 to 60½ per cent off list for carload lots, 57 to 59½ per cent for 1000-rod lots, and 56 to 58½ per cent for small lots, f.o.b. Pittsburgh.

Bolts, Nuts and Rivets

Large structural and ship rivets.....$3.90
Large boiler rivets.....4.00
Small rivets .....60 and 10 per cent off list
Small machine bolts, rolled threads
60, 10 and 10 per cent off list
Same sizes in cut threads.....60 and 10 per cent off list
Longer and larger sizes of machine bolts...60 per cent off list
Carriage bolts, ¾-in. x 6-in.:
Smaller and shorter, rolled threads.....60 per cent off list
Cut threads .....50 and 10 per cent off list
Longer and larger sizes.....50 and 10 per cent off list
Lag bolts .....65 per cent off list
Plow bolts Nos. 1, 2 and 3 head...50, 10 and 5 per cent off list
Other style heads .....20 per cent extra
Machine bolts, c.p.c. and t. nuts ⅜-in. x 4-in.:
Smaller and shorter .....45, 10 and 10 per cent off list
Longer and larger sizes.....40, 10 and 5 per cent off list
Hot pressed sq. or hex. blank nuts.....$3.25 off list
Hot pressed nuts, tapped.....$3.00 off list
C. p. c. and t. sq. or hex. nuts, blank.....$3.10 off list
C. p. c. and t. sq. or hex. nuts, tapped.....$2.85 off list
Semi-finished hex. nuts:
¼ to 9/16 in. inclusive U. S. S.....80 per cent off list
Same sizes S. A. E.....80 and 10 per cent off list
⅝ to 1 in. inclusive U. S. S. and S. A. E.,
70 and 10 per cent off list
Stove bolts in packages.....75, 10 and 12½ per cent off list
Stove bolts in bulk .....75, 10 and 10 per cent off list
Tire bolts .....60, 10 and 10 per cent off list
Track bolts .....4.90c. base

Square and Hex. Head Cap Screws

½ in. and under.....65 and 10 to 70 per cent off list
9/16 in. to ¾ in.....65 to 70 per cent off list

Set Screws

½ in. and under.....70 and 5 to 70 and 10 per cent off list
9/16 in. to ¾ in.....65 and 10 to 70 per cent off list

One cent per lb. extra for less than 200 kegs. Rivets in 100-lb. kegs, 25c. extra to buyers not under contract; small and miscellaneous lots less than two tons, 25c. extra; less than 100 lb. of a size, or broken kegs, 50c. extra.

All prices carry standard extras f.o.b. Pittsburgh.

Wire Rods

No. 5 common basic or Bessemer rods to domestic consumers, $52 to $57; chain rods, $52 to $57; screw stock rods, $57 to $62; rivet and bolt rods and other rods of that character, $52 to $57; high carbon rods, $63 to $75, depending on carbons.

Railroad Spikes and Track Bolts

Railroad spikes, 9/16-in. and larger, $3.65 per 100 lb. in lots of 200 kegs of 200 lb. each or more; spikes, ½-in., ⅝-in. and 7/16-in., $4.50; 5/16-in., $5.25. Boat and barge spikes, $4.50 per 100 lb. in carload lots of 200 kegs or more, f.o.b. Pittsburgh. Track bolts, $4.90 base per keg of 200 lb. Tie plates, $2.75 per 100 lb.

Terne Plates

Prices of terne plates are as follows: 8-lb. coating, 200 lb., $13.80 per package; 8-lb. coating, I. C., $14.10; 12-lb. coating, I. C., $15.80; 15-lb. coating I. C., $16.80; 20-lb. coating, I. C., $18.05; 25-lb. coating, I. C., $19.30; 30-lb. coating, I. C., $20.30; 35-lb. coating, I. C., $21.30; 40-lb. coating, I C., $22.30 per package, all f.o.b. Pittsburgh, freight added to point of delivery.

Iron and Steel Bars

Steel bars at 2c. to 2.35c. from mill. Refined bar iron, 3c.

Welded Pipe

The following discounts are to jobbers for carload lots on the Pittsburgh basing card:

Butt Weld

Steel			Iron		
Inches	Black	Galv.	Inches	Black	Galv.
⅛, ¼ and ⅜	50½	24	⅜	15½	+11½
½	54½	40	½	24½	6½
¾ to 3	57½	44	¾ to 1½	29½	13½
Lap Weld					
2	50½	38	2 to 2½	25½	11½
2½ to 6	53½	41	3 to 6	27½	14½
7 to 12	50½	37	7 to 12	24½	11½
13 and 14	41				
15	38½				
Butt Weld, extra strong, plain ends					
⅛, ¼ and ⅜	46½	29	¼	+13½	+46½
½	51½	39	⅜	13½	+ 3½
¾ to 1½	55½	43	½	23½	10½
2 to 3	56½	44	¾ to 1½	29½	14½
Lap Weld, extra strong, plain ends					
2	48½	37	2 to 2½	26½	13½
2½ to 4	51½	40	3 to 4	28½	16½
4½ to 6	50½	39	4½ to 6	27½	15½
7 to 8	46½	33	7 to 8	19½	7½
9 to 12	41½	28	9 to 12	14½	2½

To the large jobbing trade an additional 1, 5 and 2½ per cent is allowed over the above discounts, which are subject to the usual variations in weight of 5 per cent.

On butt and lap weld sizes of black iron pipe discounts for less than carload lots to jobbers have been seven (7) points lower (higher price) than carload lots and on butt and lap weld galvanized iron pipe have been nine (9) points lower (higher price).

Boiler Tubes

The following are the prices for carload lots f.o.b. Pittsburgh:

Lap Welded Steel		*Charcoal Iron*	
1¾ to 2 in.	19½	1¾ to 1⅞ in.	+10
2¼ in.	24	2 in.	List
2½ to 3¼ in.	30½	2¼ in.	—2
3½ to 4½ in.	40½	2½ in.	—6
		2¾ to 3¼ in.	—7
		3½ to 4½ in.	—12

Standard Commercial Seamless—Cold Drawn or Hot Rolled

	Per Net Ton		Per Net Ton
1 in.	$327	1¾ in.	$207
1¼ in.	267	2 to 2½ in.	177
1⅝ in.	257	2¾ and 3¾ in.	167
1½ in.	207	4 in.	187
		4½ to 5 in.	207

These prices do not apply to special specifications for locomotive tubes nor to special specifications for tubes for the Navy Department which will be subject to special negotiations.

Sheets

Prices for mill shipments on sheets of standard gage in carloads, f.o.b. Pittsburgh, follow:

Blue Annealed

	Cents Per Lb.		Cents Per Lb.
No. 8 and heavier	3.15 to 3.45	Nos. 11 and 12	3.25 to 3.60
Nos. 9 and 10 (base)	3.20 to 3.55	Nos. 13 and 14	3.30 to 3.65
		Nos. 15 and 16	3.40 to 3.75

Box Annealed, One Pass Cold Rolled

	Cents Per Lb.		Cents Per Lb.
Nos. 17 to 21	3.75 to 4.15	No. 28 (base)	4.00 to 4.35
Nos. 22 to 24	3.85 to 4.20	No. 29	4.10 to 4.45
Nos. 25 and 26	3.90 to 4.25	No. 30	4.20 to 4.55
No. 27	3.95 to 4.30		

Galvanized Black Sheet Gage

	Cents Per Lb.		Cents Per Lb.
Nos. 10 and 11	4.25 to 4.70	Nos. 25 and 26	4.95 to 5.40
Nos. 12 to 14	4.35 to 4.80	No. 27	5.10 to 5.55
Nos. 15 and 16	4.50 to 4.95	No. 28 (base)	5.25 to 5.70
Nos. 17 to 21	4.65 to 5.15	No. 29	5.50 to 5.90
Nos. 22 to 24	4.80 to 5.25	No. 30	5.75 to 6.20

Tin-Mill Black Plate

	Cents Per Lb.		Cents Per Lb.
Nos. 15 and 16	4.00 to 4.15	No. 28 (base)	4.20 to 4.35
Nos. 17 to 21	4.05 to 4.20	No. 29	4.25 to 4.40
Nos. 22 to 24	4.10 to 4.25	No. 30	4.25 to 4.40
Nos. 25 to 27	4.15 to 4.30	Nos. 30½ and 31	4.30 to 4.45

Non-Ferrous Metals

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York		Tin	Lead		Zinc	
		Electro-	New	New	St.	New	St.
Feb.	Lake	lytic	York	York	Louis	York	Louis
23.....	13.25	12.75	32.00	4.35	4.00	5.35	4.95
24.....	13.12½	12.62½	32.25	4.25	4.00	5.25	4.90
25.....	13.12½	12.62½	31.50	4.00	4.00	5.15	4.75
26.....	13.12½	12.62½	....	3.95	3.90	5.15	4.75
28.....	13.00	12.50	30.00	3.95	3.90	5.10	4.75
March 1.....	13.00	12.50	30.00	4.00	3.90	5.10	4.75

NEW YORK, March 1.

Buying does not increase and prices continue to decline. There is no improvement in the copper market and quotations are lower. On declining prices a fair business has been done in tin. Buying of lead and zinc have not increased and the prices of both have fallen.

New York

Copper.—The improvement in the market which was expected to follow the financing of the surplus stocks has not materialized. Buying is negligible either for domestic or export account and prices are lower. For such small business as is reported electrolytic copper has fallen as low as 12.50c., delivered, which we quote as the market, the range being 12.50c. to 12.75c. for prompt and early delivery, depending on conditions. Lake copper is also lower but largely nominal at 13c. to 13.25c. Forward positions for both grades are ⅛c. to ¼c. higher, depending on the delivery.

Copper Averages.—The average price of Lake copper for the month of February, based on daily quotations in THE IRON AGE, was 13.36c. The average price of electrolytic copper was 12.83½c.

Tin.—The most important development in this market is the confirmed report that the Malay Government last Friday withdrew its minimum price of £203 per ton at which it would buy metal from producers, and as a result the Far Eastern market is wide open. This is the principal cause of the sharp decline of the market here and in London. On the decline here there were sales of 500 to 700 tons at 32.50c. down to 31.50c. at the end of last week. The announcement is made that the Straits Government will hold the tin it has accumulated until it can be disposed of without a loss. This is interpreted here to mean a check to any further rise in this market. Consumers still remain uninterested, but on last Thursday there was a fair demand from dealers who bought April shipment at 33c. and March-April shipment at about the same price, total sales aggregating about 250 tons. The spot market has been neglected, no one being anxious to sell, odd lots tending to hold the price down. The quotation to-day was 30c., New York. The London market has continued to decline until spot standard to-day was quoted at £158 with future standard at £162 and spot Straits at £173 per ton, or about £12 to £13 below prices a week ago. Arrivals for the month, as reported on Feb. 28, were 2585 tons, with 1535 tons reported afloat.

Lead.—Again this week the American Smelting & Refining Co. reduced its price. Two reductions were made, one on Feb. 24 to 4.20c. and the other on Feb. 25 to 4c., both New York and St. Louis. The outside market had already reached the latter level. Some dealers and consumers, believing that the low price has been reached, have put out inquiries and the market is a little more active, but no marked buying is reported. The London market to-day is quoted at £17 10s. for spot lead and £18 2s. 6d. per ton for futures. It is the feeling that so far as the American market is concerned the bottom has been reached, although London prices may go lower, in which case there would be a possibility of more imports and perhaps a lower market here. That Western miners are contracting production is a factor to be reckoned with. Foreign supplies are ample and in the absence of consumption abroad some of this surplus may take up any slack in output here. Lead sold yesterday and Saturday as low as 3.95c., New York. We quote the market at 4c., both New York and St. Louis, for the leading interest and at 3.90c., St. Louis, and 4c., New York, in the outside market, both for early delivery.

Zinc.—The market is absolutely stagnant, and such sales as are reported are confined to small lots to satisfy hand-to-mouth needs. The market has declined until prime Western is quoted at 4.75c., St. Louis, or 5.25c., New York, for the domestic product, with the imported metal available at 5.10c., seaboard.

Antimony.—The market is unchanged and wholesale lots for early delivery are quoted at 5c., New York, duty paid.

Aluminum.—Virgin metal, 98 to 99 per cent pure, in wholesale lots for early delivery, is quoted at 28c. by the leading producer, f.o.b. producer's plant, while other sellers are quoting the same grade at 23.50c. to 24.50c., New York.

Old Metals.—The market was very dull and prices a little lower. Dealers' selling prices are nominally as follows:

	Cents Per Lb.
Copper, heavy and crucible	12.50
Copper, heavy and wire	11.50
Copper, light and bottoms	10.00
Heavy machine composition	12.25
Brass, heavy	9.00
Brass, light	6.75
No. 1 red brass or composition turnings	9.50
No. 1 yellow rod brass turnings	6.50
Lead, heavy	3.50
Lead, tea	2.75
Zinc	3.00

Chicago

MARCH 1.—In the absence of demand all of the metals are weak and, with the exception of antimony, have declined. Some grades of old metals have also given ground. We quote Lake copper at 12.87½c. in carload lots; tin, 35c.; lead, 4.35c.; spelter, 5c.; antimony, 7c. On old metal we quote copper wires, crucible shapes, 8.50c.; copper clips, 8.50c.; copper bottoms, 7.50c.; red brass, 8.50c.; yellow brass, 5.25c.; lead pipe, 2.75c.; zinc, 2.50c.; pewter, No. 1, 17c.; tinfoil, 20c.; block tin, 24c., all these being buying prices for less than carload lots.

St. Louis

FEB. 28.—The non-ferrous markets continue weak, with very little demand and prices sagging. For car lots we quote: Lead, 4c.; spelter, 4.90c. In less than car lots: Lead, 4.50c.; spelter, 5.75c.; tin, 36c.; copper, 13.75c.; antimony, 7.50c. In the Joplin district ore prices showed very little change and the sales were small, being less than a quarter of the usual volume. Zinc blende, basis 60 per cent, sold at $20 to $22.50 per ton; lead ore, basis 80 per cent, $40 to $45 per ton. No calamine was sold during the week. On miscellaneous scrap metals at dealers' buying prices, we quote: light brass, 4c.; heavy yellow brass, 6.50c.; heavy red brass and heavy copper, 9c.; copper wire, 9c.; light copper, 9c.; pewter, 18c.; tinfoil, 20c.; aluminum, 10c.; zinc, 3c.; lead, 3.40c.; tea lead, 2c.

Protest Against Freight Rates

A formal complaint against the present freight rates on finished iron and steel products from Pittsburgh to Cleveland has been filed with the Interstate Commerce Commission by 15 steel consumers in Cleveland. In the complaint it is set up that the through rate on steel shipments from Pittsburgh to Cleveland exceed the combined intermediate commodity rates from Pittsburgh to Youngstown and from Youngstown to Cleveland and that this rate situation has existed since Sept. 20, 1917. Since that date the amount of the excess has varied from 1c. to 3c. per 100 lb., changing with the various rate advances. At present the through rate on steel from Pittsburgh to Cleveland is 24c. per 100 lb. in car lots and the combination of the Pittsburgh-Youngstown and Youngstown-Cleveland rates is only 21c. The Cleveland consumers want the through rate reduced at least to 21c.

PERSONAL

H. W. Torney, New York, was elected president of the Sharon Pressed Steel Co., Sharon, Pa., on Feb. 25 at a meeting of directors, and succeeds J. D. Corcoran, who served as president for the past year. Mr. Torney is head of Torney & Co. and associated with J. S. Pardee & Co., bankers of 66 Broad Street, New York. A. W. Morris was elected vice-president in charge of sales, while A. F. Swan, formerly chief engineer of the Crucible Steel Co. of America, at its Harrison, N. J., plant, will be in charge of operations. Mr. Torney has assumed his duties with the company.

James A. Baldwin, Corbin Screw Corporation, New Britain, Conn., read a paper on wrought iron before the the American Society for Steel Treating, Hartford chapter, at Hartford, Conn., Feb. 24.

James W. Armour, who has been located at the Detroit office of the Murphy Iron Works, is now located at the Worcester, Mass., works of the Sanford Riley Stoker Co.

H. M. Pratt, formerly manager of the branch office of the Southern Iron & Equipment Co. at New Orleans, has been appointed general sales manager and has been transferred to the general offices in Atlanta, Ga. He has been succeeded at New Orleans by A. C. Wood. Mr. Pratt has been connected with the company for 12 years.

C. M. Eason, formerly vice-president Hyatt Roller Bearing Co., Harrison, N. J., has become vice-president of the Samson Tractor Co., Janesville, Wis.

H. T. Miller, commercial engineer National Tube Co., Pittsburgh, gave an illustrated talk on "Welded Steel Pipe from the Ore to the Finished Product" before the Boston section, American Society of Mechanical Engineers, and the Massachusetts chapter, American Society of Heating and Ventilating Engineers, at the City Club, Boston, March 2.

W. H. Bond, formerly mechanical engineer with the Foundation Co., New Orleans, has joined the Joubert & Goslin Machine & Foundry Co., Birmingham, Ala.

G. D. Benson, formerly of the sales force of the Federal Machinery Sales Co., Chicago, has become associated with the Dimend Machinery Co., general machinery dealer, 311 Machinery Hall, Chicago.

V. B. Fisher now represents the Atlas Crucible Steel Co. in the Philadelphia district, having formerly served the Midvale-Cambria Steel Co. in the same district.

Robert C. Weller is appointed general sales manager of the Lakewood Engineering Co., with headquarters at Cleveland. Carlton R. Dodge is appointed western sales manager with headquarters at 1215 Lumber Exchange Building, Chicago.

James R. Lowe has been made general sales manager of the Harrisburg Foundry & Machine Works, Harrisburg, Pa., having previously been sales engineer with the Midwest Engine Co., Anderson, Ind.

Ray L. Somers has resigned as plant engineer of the Greenfield Tap & Die Corporation, Greenfield, Mass., to open an industrial engineering office at Providence, R. I.

James A. Wolf has purchased a substantial amount of stock in the Benton Harbor Castings Co., Benton Harbor, Mich., and has been made superintendent of the company's plant.

Ira T. Hook, formerly expert on physical testing in the Detroit laboratory of the General Motors Corporation, has been placed in charge of the materials laboratory, Mason Engineering Laboratory, Yale University.

C. E. Anderson, formerly engineer for the E. W. Bliss Co., Brooklyn, has become designer for the American Machine & Foundry Co., Brooklyn.

G. S. Crane, who has been manager of the Cleveland office of the Cutler-Hammer Mfg. Co., Milwaukee, will become manager of controller sales at the main office in Milwaukee. L. B. Timmerman will be in charge of the Cleveland office, and will act as assistant to A. G. Pierce, manager of the central district. The Cincinnati office will become a part of the central district with R. I. Maujer as branch manager. E. N. Lightfoot will assume the title of manager of the heating department with headquarters at the New York works, and will be in full charge of all matters relating to the sale of electric heating devices.

F. G. Kenyon has resigned from the tool drafting room of the Bullard Machine Tool Co., where he was chief checker, to become instructor in mechanical and architectural drafting and machine design at the State Trade School, Bridgeport, Conn.

Albert Walton, industrial engineer, has returned to consulting practice and has opened offices in the Commercial Trust Building, Philadelphia, and in the Court Square Building, Springfield, Mass., under the firm name of Walton & Wright, industrial engineers and manufacturing accountants.

Arthur Purdon has been appointed general sales agent of the Ideal Electric & Mfg. Co., Mansfield, Ohio, for the Utah territory with offices at 615 Newhouse Building, Salt Lake City, Utah.

Ernest T. Clary, assistant treasurer and works manager Whitcomb-Blaisdell Machine Tool Co., Worcester, Mass., has resigned to associate himself with the Whitin Machine Co., Whitinsville, Mass., builders of textile machinery.

E. C. Edmundson, for the past 12 years associated with Johnson-Peter Co., jobber of boiler tubes, resigned recently to take charge of the boiler tube department of Williams & Co., 901 Pennsylvania Avenue, N. S., Pittsburgh.

N. C. Hoyles, C. E., has been appointed manager of the Cincinnati branch of the Pittsburgh Testing Laboratory, at 813 Race Street, Cincinnati. From 1909 to 1914 he was manager of the Birmingham, Ala., branch of this company. In 1914 he served with the Canadian Engineers, and at the close of the war was mustered out with the rank of lieutenant colonel. For the past year he has been assistant manager of the Pittsburgh Testing Laboratory's New York office.

Thomas H. S. Andrews, M. E., until recently on the engineering staff of the J. G. White Engineering Corporation, is now identified with E. G. Long Co., 50 Church Street, New York, as its secretary.

George T. Dewey was re-elected president of the Baldwin Chain & Mfg. Co.. Worcester, Mass., at the annual meeting, and William F. Cole, vice-president, and J. H. Kendall, treasurer.

Edwin Musser Herr, president Westinghouse Electric & Mfg. Co., spoke on "Modern Business in General," especially as it related to the Springfield works of his company, at a dinner given by the Springfield, Mass., Chamber of Commerce at Hotel Kimball, Feb. 24. Mr. Herr's talk was illustrated by motion pictures and stereopticon views.

James P. Sprague, Kansas City, Mo., has been appointed district representative with the Falcon Steel Co. in Kansas, Nebraska, Oklahoma and the western portion of Iowa and Missouri for the sale of black, blue annealed and galvanized steel sheets.

Fred C. Billings was re-elected president of the Billings & Spencer Co., Hartford, Conn., forgings, etc., at the annual meeting, and L. D. Parker, vice-president and treasurer. J. B. Seal was made a director in place of the late Charles E. Billings.

R. E. Blazo, Read, Fears & Miller, Inc., Boston, pig iron and coke, has been made a director of that company.

Bryan Robertson has retired as manager of steel sales of Fairbank & Co., jobbers in iron, steel, coal and coke, Wade Building, Cleveland. His successor will be appointed shortly.

Frank Hodson, president Electric Furnace Construction Co., Philadelphia, has been elected a member of the executive committee of the Philadelphia Foundrymen's Association.

At the recent annual meeting of the Wellman-Seaver-Morgan Co., Cleveland, three new directors were added to the board, these being Arthur G. McKee &

Co., George W. Burrell, vice-president and works manager of the company, and A. G. Tame, vice-president of the Cleveland Trust Co.

W. J. Pick, Rockford, Ill., has been appointed manager of the new branch office which has been established at 408 Gay Building in Madison, Wis., by the Crane Co., Chicago.

OBITUARY

Comly B. Shoemaker

COMLY B. SHOEMAKER, one of the pioneers of the iron and steel industry, who for 32 years was president and general manager of the Glasgow Iron Co., Pottstown, Pa., died at his home in Philadelphia on Thursday, Feb. 24, of double bronchial pneumonia after a two-day illness. Mr. Shoemaker was 82 years old on Nov. 22, 1920. On Jan. 31 last Mr. Shoemaker retired from the presidency of the Glasgow company and was elected chairman of the board of directors. However, he did not relinquish his work, and on the Tuesday morning preceding his death he was, as usual, the first one in the Philadelphia office. That day he was taken ill and was removed to his home, his death coming two days later.

Mr. Shoemaker first engaged in the iron business at the age of 20 at Pine Forge, Pa. His first work was rolling iron plates, and it is noteworthy that the Glasgow Iron Co. is to-day still one of the few companies in the United States which rolls iron plates. Mr. Shoemaker became a partner eventually in the plant in which he had his first job, the firm being known as Bailey & Shoemaker. Mr. Bailey was his father-in-law. In 1875 this firm was succeeded by the Glasgow Iron Co., of which Mr. Shoemaker was a director and treasurer, later becoming president.

Mr. Shoemaker was prominent in charity work in Philadelphia, having been for 20 years president of the Bedford Street Mission. He is survived by three daughters and one son, C. B. Shoemaker, second, who was recently elected president of the Glasgow Iron Co.

JOHN A. SUTTON, who had been identified with the Crucible Steel Co. of America since its organization in 1900, and who was vice-president until about a year ago, died at his home in Pittsburgh, Feb. 22. He was born in Indiana, Pa., 68 years ago and, after attending several private schools, entered Lafayette College in 1870, but left in his sophomore year upon the death of his father. He went to Pittsburgh in 1873 and became a partner in Smith, Sutton & Co., the plant of which later became LaBelle works of the Crucible Steel Co. He was also connected with Park Bros. & Co., Ltd., another constituent company of Crucible Steel Co., and served as secretary and treasurer of the Clairton Steel Co. until the Crucible Steel Co. sold it to the United States Steel Corporation. He was a member of the Duquesne Club and the Allegheny Country Club.

I. E. EDWARDS, aged 42, general manager Blairsville Iron Works, Blairsville, Pa., died Feb. 24 at his home, following a brief illness of pneumonia. For several years he was electrical foreman at the Ohio works of the Carnegie Steel Co., Youngstown, Ohio, leaving that connection to accept a similar position with the National Tube Co. at Lorain, Ohio. Three years later he went to Sharpsville, Pa., as chief engineer for the Valley Mould & Iron Corporation, a position he retained for 11 years. In 1917 he became works manager of the Marshall Foundry Co., Blacklick, Pa., and about a year ago became part owner of the Blairsville Iron Works, which he served as general manager until his death.

DAVID H. ANDREWS, organizer of the Boston Bridge Works, Boston, died at his home in Newton Center, Mass., Feb. 24. Mr. Andrews was born in Pepperell, Mass., Sept. 17, 1844, was graduated from Dartmouth College, Hanover, N. H., following which he was engaged in mechanical engineering in Worcester, Mass., for two years, later was an assistant engineer for the National Bridge & Iron Works, and in 1876 began business under his own name as a builder of bridges. In 1891 he organized the Boston Bridge Works, which was incorporated in 1901, of which he was president and a director.

JOHN S. HERBERT, assistant superintendent Gautier plant, Cambria Steel Co., Johnstown, Pa., died of heart failure, Feb. 24. Mr. Herbert, who was 42 years old, formerly was a resident of Pittsburgh, going to Johnstown in 1912 to become associated with the Cambria Steel Co. He was assistant manager of the safety department until 1917, when he was promoted to the position of assistant superintendent of the Gautier plant.

WALLACE T. STRANGWARD, secretary Forest City Foundry & Mfg. Co. and sales manager of that company's warm-air furnace department, was killed, Feb. 1, when the automobile which he was driving was struck by a street car. He was 34 years of age. He was a brother of P. J. Strangward, general manager of the company, and also of W. J. Strangward, general manager of the Walworth Run Foundry Co., Cleveland.

LOUIS GENDRON, last of the original directors of the Warren Steam Pump Co., Warren, Mass., died at the St. Vincent Hospital, Worcester, Mass., Feb. 22, aged 71. Mr. Gendron was born in Canada, but was a resident of Warren for 56 years.

ADELBERT P. HINE, for many years general superintendent of the Waterbury, Conn., branches of the American Brass Co., died at his home in Woodbury, Conn., Feb. 16. Mr. Hine was one of the pioneers in the brass industry of Connecticut, and was associated with the above company for more than 40 years. In 1913 he retired from active life.

WILLIAM EBEN STONE, Cambridge, Mass., died there Feb. 23. Mr. Stone was born in Walpole, Mass., Nov. 27, 1845. He was graduated from Brown University in 1866, and then took a special course in mining engineering at the Massachusetts Institute of Technology. In the following seven years he was in the employ of various iron mining companies, and, in 1874, became secretary of the Champion Iron Co. of Michigan, and later its treasurer and general manager, with headquarters in Boston.

Will of W. P. Snyder

The will of the late W. P. Snyder was admitted to probate in Pittsburgh Feb. 25. No estimate of the value of the estate was given. Bequests of money are made to sisters and other relatives. A bequest of $10,000 is made to the Snyder Memorial Church of Jacksonville, Fla., and various amounts of money are left to employees in the Snyder home. The estate consists largely of the Shenango Furnace Co. and its allied companies and the will provides for the continuance for a period of years of the business of the company and of William P. Snyder & Co. A division of the estate is to be made eventually among Mr. Snyder's wife and children. The executors named are Mrs. Snyder, William P. Snyder, Jr., Henry Irwin, Jr., George L. Collard and Charles H. McKee.

Many Idle Wheeling Plants

WHEELING, W. VA., Feb. 28.—Operating schedules of the subsidiary companies of the Wheeling Steel Corporation for this week, as announced at the offices of the corporation here, are as follows:

LaBelle Iron Works.—Wheeling plate mills and nail factory idle; Steubenville plant idle with the exception of one furnace in the tube mill; coal mines idle.

Whitaker-Glessner Co.—Martins Ferry plant idle; Beech Bottom plant operating; Creek mill idle; Portsmouth plant idle.

Wheeling Steel & Iron Co.—Martins Ferry furnace idle; top furnace idle; Belmont furnace and plate mills idle; Yorkville tin mill idle; Benwood steel works and tube mill idle.

The corrosion of metal surfaces is to be discussed on April 11 at the City Club, Hartford, Conn., by a joint meeting of the Connecticut Valley section of the American Chemical Society and the Hartford section of the American Society of Mechanical Engineers.

IRON AND INDUSTRIAL STOCKS

Market Apparently Awaits Some Incentive of a Definite Character

On leading Eastern exchanges of the country the past week interest centered largely in such stocks as American Woolen, Atlantic, Gulf & West Indies, and United Fruit, quotations for which fluctuated widely at times. Trading in more fundamental issues on stock exchanges and over the counter was comparatively small and at irregular prices. As a group, the automobile stocks and allied issues showed greater softness than iron, steel and industrials as a whole, notwithstanding reports of an expanding automobile business. Notation of a further increase in the total number of idle freight cars in this country has acted as a wet blanket on the market for railroad stocks and equipment building issues. Copper stocks show little or no rallying power. In fact, there is little in day to day developments to warrant active buying or selling of any one class of stocks.

The fact that Eastern banking institutions are less concerned over possible losses suggests an acute credit tension has passed, yet the fact remains that money is still difficult to obtain except under certain conditions and at rates not usually attractive to investors or industry. The readjustment of labor, cotton, leather, grains and many lines of finished products is not completed, another reason why securities markets display little life except in purely speculative spots. The continued firm stand by the United States Steel Corporation regarding prices is offset by quotations named by independent mills. consequently the net market change in prices for the week on iron and steel stocks is unimportant. The market for securities in general, like those for raw, semi-finished and finished materials, apparently awaits some incentive of a definite character.

The range of prices on active iron and industrial stocks from Saturday of last week to Monday of this week was as follows:

Allis-Chalm. com.	35⅝- 36¾	Int. Har. com....	98⅛- 99¾
Allis-Chalm. pf..	79⅞- 80	Lack. Steel	54⅜- 56
Am. Can com...	29 - 30⅛	Midvale Steel ...	30⅜- 31¼
Am. Can pf.....	85 - 86	Nat.-Acme	20½- 22
Am. C. & F. com.	122⅜-124⅛	Nat. E. & S. com.	61½- 62⅛
Am. C. & F. pf..	113 -114	Nat. E. & S. pf.	93 - 93⅛
Am. Loco. com..	83 - 84¾	N. Y. Air Brake.	83¾- 87
Am. Loco. pf.... ..	-107¼	Nova Scotia Steel	36¾- 37
Am. Rad. com...	72 - 72⅛	Press. Steel com.	91 - 94¼
Am. Stl. F. com.	29⅝- 30¼	Ry. Stl. S. com..	85¼- 87¾
Am. Stl. F. pf.. ..	- 89¼	Replogle Steel ..	24 - 31
Bald. Loco. com.	88 - 90⅛	Republic com. ..	66 - 67⅜
Bald. Loco. pf.. ..	-100	Republic pf.	- 96
Beth. Steel com.	52¼- 53½	Superior Steel	- 41½
Beth. Stl. Cl. B.	56¼- 58	Trans.-Williams..	38⅝- 40
Beth. Stl. 8% pf.	105 -105⅝	Un. Alloy Steel..	28¾- 33
Chic. Pneu. Tool.	64 - 65	U. S. Pipe com..	13 - 15½
Colo. Fuel	27¼- 29	U. S. Pipe pf...	45 - 45¾
Cruc. Steel com.	90¼- 94	U. S. Steel com..	82½- 84
Cruc. Steel pf...	88 - 89	U. S. Steel pf....	109½-111½
Gen. Elec.	129¼-131⅛	Vanadium Steel..	32 - 36⅞
Gt. No. Ore Cert.	29⅝- 30	Va. I. C. & C... ..	- 89
Gulf States Steel	31¼- 32¼	West'ghouse Elec.	45¾- 46¾

Trumbull Steel Co. Meeting

Jonathan Warner, Youngstown, Ohio, president Trumbull Steel Co., Warren, Ohio, has been elected to the board of directors of the Truscon Steel Co., Youngstown, succeeding R. M. Dyar of Detroit, resigned. At an adjourned meeting of stockholders of the Truscon company, Feb. 21, in Detroit, the by-laws were amended to increase the number of directors from seven to nine. One of the two new members is to be from Youngstown, where the company's principal properties are located.

Shareholders voted to increase the authorized common stock from $2,000,000 to $4,000,000 and it is understood that it is the intention of the company to declare a common stock dividend. In March, 1920, a 20 per cent stock dividend was paid on the junior issue. The company has $1,782,620 common outstanding and $2,016,340 preferred, of an authorized issue of $2,500,000.

Directors who were elected are Julius Kahn, Jonathan Warner, T. H. Kane of Youngstown; Day Krolik, Henry M. Butzel, Joseph N. Krolik and Albert Kahn of Detroit. Officers elected are: President, Julius Kahn; vice-president, T. H. Kane; secretary, Henry M. Butzel; treasurer, Day Krolik; vice-president in charge of sales, Gustave Kahn.

President Kahn informed stockholders that the past year has been a satisfactory one for the company. He stated that the upturn in business awaits stabilization of steel prices and that many orders are being held up because consumers are not yet certain that steel prices may not further decline. Buying will start and the recovery will be speedy when the leading steel producing interests announce that prices of their products are at the bottom, he believes. The trade outlook is bright, with price uncertainties removed.

The company's principal plant is located on a 41-acre site at Youngstown; it also has a plant in Japan to supply its products to the Orient. The company owns the Truscon laboratories in Detroit. It has subsidiary companies at Walkerville, Ont., Canada, and London, England, which supply Canada and Great Britain. The company also has licensed concessions where its products are marketed on a royalty basis in every country of Europe. The Oriental countries, Australia and South America are covered by representatives.

The company manufactures and sells the various building products known as the "Truscon building products," for fireproof construction, steel reinforcing materials for concrete, metal lath, and hyrib, expanded metal, steel sash, doors and partitions, standard steel buildings, structural steel fabrication, a complete line of pressed steel stampings, automobile parts and pressed steel foundry flasks, cold-rolled angles, channel sections and the like, as well as paints for the manufacturing and building trades, waterproofings, cement asbestos shingles and cement products.

Will Resume Payments to the Railroads

WASHINGTON, March 1.—Treasury officials have announced that partial payments to the railroads from the Government guaranty fund will be resumed as soon as the amounts claimed by the various carriers are certified to the Treasury by the Interstate Commerce Commission. The statement was made on the strength of the passage of the Winslow-Townsend bill, permitting partial payments, which was signed by President Wilson Saturday. The amount due the railroads is estimated at $350,000,000. Receipts from the Treasury's issue of certificates of indebtedness under date of Feb. 15 has provided about $100,000,000 for the railroads, sufficient to meet all certified payments up to March 15. The problem of meeting the remainder after that date, it was stated, will have to be solved by the incoming administration, though no difficulty is anticipated in this direction.

The Winslow-Townsend bill was passed by Congress and signed by the President at a time when organized labor was making vigorous protest against it. The immigration bill also was adopted in conference in the face of a similar situation.

Patent Laws in Congress

WASHINGTON, March 1—The Nolan bill extending for six months patent privileges to citizens of foreign countries that afford Americans similar rights was passed by Congress last week, first by the House and then by the Senate. By its enactment into law foreign inventors will be allowed the additional time stated to file applications for patents in the United States and American inventors will be granted a like privilege. During the war inventors in foreign countries were unable to take advantage of treaty provisions and the law granting one year after filing an application in their own country within which to file applications in the other treaty countries with the same legal effect as if they had all been filed simultaneously.

The bill of Representative Nolan to reorganize the Patent Office and to increase salaries after passing both branches of Congress was blocked in the Senate when the conference report, previously adopted by the House, was held up. Vigorous objection was made to the Senate rider allowing Government employees to assign patents to the Federal Trade Commission for administration. Leading manufacturing interests have expressed strong disapproval of this feature of the bill, but, with others, have expressed regret that because of its otherwise highly desirable purposes, it should have been encumbered with the rider which prevented its passage. It is proposed to eliminate the rider and have the bill passed at the special session of Congress.

Machinery Markets and News of the Works

FURTHER REDUCTIONS

Brown & Sharpe and Cincinnati Milling Machine Co. Name Lower Prices

Business Continues Dull in All Markets—More Talk of Possible Railroad Purchases

Just prior to the meeting of the National Machine Tool Builders' Association at Cleveland last week, announcement was made of reductions in prices of about 15 per cent by the Brown & Sharpe Mfg. Co. and the Cincinnati Milling Machine Co. No other price reductions of importance have been made by machine-tool builders during the week.

Business continues dull in all of the markets. Inquiries and orders are few and are mostly for single machines.

It is reported in Chicago that the Burlington Railroad has a large list of tools on its 1921 budget, but actual purchases are dependent on market developments. The Big Four also has prepared a list of equipment required for its shops at Beech Grove, Ind., but in this case buying may also be deferred for some months. Purchases by the Santa Fe Railroad total about $125,000.

Though export trade is quiet, a few orders are coming to the United States, principally from Japan and India. The Japanese Navy has been buying quietly for some weeks.

New York

NEW YORK, March 1.

The local machine-tool market continues exceedingly dull. Occasional orders for single machines are being received and a great many inquiries are pending, but it is difficult for sellers to get buyers to take action. In the export trade there is a moderate degree of activity in inquiries and sales for Japan and India. As previously reported, the Japanese Navy has been buying a number of machines, but this has been spread over a considerable period and for that reason has attracted relatively little attention.

Perhaps cylinder grinding machines are in better demand than any other type of tool, this being due to activity among small repair shops, which regrind automobile cylinders. One well-known maker of cylinder grinders is enjoying a fairly active business.

The reductions in prices, amounting to about 15 per cent, by the Brown & Sharpe Mfg. Co. and the Cincinnati Milling Machine Co. were the principal topics of interest in the trade the past week. A number of other leading machine-tool manufacturers, while having announced no formal change in prices, have been meeting competition, even when doing so meant cutting prices from 15 to 25 per cent.

A better tone pervades the crane market this week. Besides the orders still pending there are several prospective inquiries which may be issued in a few weeks. Among current inquiries are: White Fuel Oil Engineering Corporation, 742 East Twelfth Street, New York, a 10-ton and a 20-ton overhead traveling crane for a new foundry; Mechanicsville Sand & Gravel Co., Mechanicsville, N. Y., a 15-ton, 8-wheel locomotive crane with 1-yd. capacity clamshell bucket; Sampson & Reuter, 221 Catherine Street, Elizabeth, N. J., a 15-ton or 20-ton, 50-ft. boom locomotive crane with 1-yd. capacity clamshell bucket; Simmons Machine Co., 981 Broadway, Albany, N. Y., a 15-ton, 50-ft. boom locomotive crane; Florida East Coast Railroad Co., 120 Broadway, New York, a 100-ton wrecking crane; Delaware, Lackawanna & Western Railroad, 90 West Street, New York, a 20-ton, 40-ft. boom steam locomotive crane. A. R. Masters, Hampton, Va., has requested bids on a 5-ton, 31-ft. span hand power crane for the United States Coast Artillery School at Old Point Comfort and James Gillies & Sons, 177 Thirteenth Street, Brooklyn, N. Y., are in the market for a 15-ton, 51-ft. span overhead traveling crane. The city of New York will shortly be in the market for about 74 drum type winches for municipal docks.

Among recent sales are: Industrial Works, a 40-ton locomotive crane to Czarnikow Rionda, New York, for export to Cuba; Champion Engineering Co., two 10-ton, 67-ft. span and 82-ft. span and one 5-ton, 83-ft. 3-in. span overhead traveling cranes to the Hoosier Rolling Mill Co., Terre Haute, Ind.; Philip T. King, 30 Church Street, New York, a 15-ton, 50-ft. boom, second hand Ohio locomotive crane to the Crane Co., Bridgeport, Conn.; Browning Co., two 15-ton, 50-ft. boom locomotive cranes to the Parklap Construction Corporation, 84 Pine Street, New York, and one 15-ton locomotive crane to the A. R. Gilmore Sand Co., Linden, Pa.; Brown Hoisting Machinery Co., a 15-ton, 50-ft. span locomotive crane to the J. G. White Engineering Corporation, New York; Shepard Electric Crane & Hoist Co., 24 3-ton and nine 4-ton electric hoists to the Chickasaw Shipbuilding & Car Co., Fairfield, Ala., and two 2-ton, 18-ft. span single I beam cranes to the Fox Furnace Co., Elyria, Ohio.

The Utica Gas & Electric Co., 222 Genesee Street, Utica, N. Y., will soon take bids for the erection of a new electric generating plant at Harbor Point Station, one-story, 118 x 130 ft., and estimated to cost about $1,500,000 with machinery. Thomas E. Murray, Inc., 55 Duane Street, New York, is consulting engineer.

The Rees & Stindt Machine Works, Inc., has been incorporated with a capital of $30,000 by J. E. Wick, G. Hazen and W. S. Irwin, 9 West Fourteenth Street, to manufacture machinery and tools.

The Holbrook Co., West End Avenue and Sixty-seventh Street, New York, has awarded a contract to the Austin Co., 217 Broadway, for its proposed new plant at Hudson, N. Y., to manufacture automobile bodies. It will be one-story, 100 x 260 ft., steel and reinforced-concrete.

The Resistance Tire & Rubber Corporation, New York, has been incorporated with a capital of $250,000 by D. F. O'Meara, F. G. J. Campbell and W. Troy, 60 Broadway, to manufacture automobile tires and mechanical rubber goods.

The Monarch Metal Bed Co., New York, has been incorporated with a capital of $50,000 by A. A. Detsch, L. Birch and L. J. Rosette, 740 West End Avenue, to manufacture iron and brass bedsteads.

The United Electric Light & Power Co., 130 East Fifteenth Street, New York, will take bids at once for a new three-story electric plant, 30 x 100 ft., at 115 West Ninety-seventh Street, to cost about $170,000.

The Precision Products Corporation, New York, has been incorporated with an active capital of $31,250, by G. W. Semmes, G. Akerlund and C. J. Beatey, 17 Battery Place, to manufacture precision instruments and other equipment.

E. L. Megill, 60 Devore Street, Brooklyn, has commissioned Gilbert & Ashfield, architects, 350 Fulton Street, to prepare plans for a new two-story factory, 40 x 40 ft., at Atlantic Avenue and Adelphi Street, for the manufacture of metal products.

The Long Beach Power Co., Park Street, Long Beach, N. Y., has completed plans for the construction of a new one-story power plant to cost about $125,000 with machinery. Ophuls, Hill & McCreery, Inc., 112 West Forty-second Street, is engineer.

Todd & Buick, Inc., Plattsburg, N. Y., has been incorporated with a capital of $75,000 by M. J. Clow, K. F. Klein and J. B. Todd, Plattsburg, to manufacture gasoline motor equipment and parts.

The Eclipse Textile Devices, Inc., Elmira Heights, N. Y., has been incorporated with a capital of $25,000 by A. D. Falck, E. J. Dunn and L. S. Whittier, Elmira Heights, to manufacture textile machinery and parts.

The Monsoon Cooling System, Inc., 70 West Forty-fifth

Street, New York, manufacturer of fans, blowers and other mechanical draft apparatus, is planning the erection of a new two-story factory at 71 North Sixth Street, Brooklyn, to comprise over 5000 sq. ft. of space. J. F. Daly is president.

The Watson Elevator Co., 407 West Thirty-sixth Street, New York, manufacturer of elevators and equipment, has acquired property adjoining its present works at 409 West Thirty-sixth Street, for an extension to the plant. C. M. Watson is president.

Freight handling and conveying machinery will be installed in the new shipping warehouse station to be established by Watson Brothers, 4 Fletcher Street, New York, on the Atlantic Basin, Brooklyn. Ten one-story warehouse buildings, covering a site 200 x 500 ft., at Ferris, Conover, Van Dyke and Coffey streets, opposite Pier 44, have been leased for a period of 10 years. The buildings will be equipped for transferring, trans-shipping, reconditioning and repacking cargoes.

The McLoughlin Pipe & Supply Co., 47 Cliff Street, New York, has awarded contract to George J. Atwell, 147 Fourth Avenue, for a one-story building, 75 x 100 ft., at Nelson Avenue and Auburn Street, Long Island City, to cost about $23,000. It recently acquired property, 169 x 265 ft., in the Degnon Terminal district, at Nott Avenue and Meadow Street, Long Island City, and is having plans drawn for a two-story building, 100 x 100 ft., to be erected at a cost of about $50,000.

The Metal Parts & Tool Co., Schenectady, N. Y., has been organized by H. L. Kay and S. R. Van Patten, Schenectady, to manufacture metal specialties for automobile service, tools, etc.

The Public Safety Signal Corporation, Union Hill, N. J., has been incorporated with a capital of $100,000 by Harry A. Kleine, L. and Hugo Faller, 487 Palisade Avenue, to manufacture signal devices for automobile service.

The Nassau Foundry & Mfg. Co., Nassau, N. Y., has been organized by C. G. and L. Z. Zeilman, Nassau, to manufacture iron and steel castings, etc.

Fire, Feb. 20, destroyed the machine shop and other buildings at the factory of Snyder Brothers, Pittstown, N. J., manufacturers of agricultural implements, with loss estimated at about $20,000. John W. Snyder is head.

The International Piston Ring Co., 614 Main Street, Boonton, N. J., has been organized by Thomas G. Saxton, 636 Church Street, and Frederick S. Yale, Spruce Street, to manufacture piston rings and other finished products. It is understood that the company will be affiliated with the Yale Piston Ring Co. with local plant on Myrtle Avenue.

The M. W. Kellogg Co., 117 Westside Avenue, Jersey City, N. J., manufacturer of pipe, fittings and other power plant specialties, has filed plans for an addition to cost about $24,000.

The New Process Metals Corporation, Newark, N. J., has been incorporated with a capital of $250,000 by Walter F. Young, Division Place; Sidney T. Page, West Paterson, N. J., and Frank J. Morris, West Orange, N. J., to manufacture metal products.

Fire, Feb. 21, destroyed the plant of the International Coal Products Co., 38 Shaw Avenue, Irvington, N. J., manufacturer of coal briquettes, with loss estimated at $100,000. The damage included machinery for manufacture, conveying equipment, and power house. It has tentative plans under way for rebuilding, and it is understood that this will be in another location.

Bender & Son, Newark, N. J., are having plans prepared for a one-story machine shop at Emmet Street and New Jersey Railroad Avenue, 50 x 100 ft. Convery & Klemmt, 764 Broad Street, are architects.

The Replacement Auto Parts Co., Newark, has been incorporated with a capital of $100,000 by Peter Peiffer, Sr. and Jr., and Clarence Ball, 19 Elm Street, to manufacture automobile parts.

The Newark Umbrella Frame Co., Newark, N. J., manufacturer of umbrella frames and rods, has leased the two-story factory at 355 Ogden Street, 50 x 125 ft., for the establishment of a new plant. Alterations and improvements will be made and it is proposed to commence operations about May 1. P. H. Seery, head of the Seery Tube Co., 426 Mulberry Street, is president.

The Newark Stream Line Body Co., 221 Morris Avenue, Newark, N. J., has filed notice of organization to manufacture automobile bodies. Peter Solek, 62 Jones Street, heads the company.

Mechanical and electrical equipment will be installed in the new industrial school building to be constructed by the Board of Freeholders, Newark, at the Overbrook Hospital, near Caldwell. The Board has ordered plans and specifications prepared for the building, and estimates of cost made.

The Quayle Electrical Service Co., 85 Central Avenue, Newark, has filed notice of organization to manufacture electric fixtures and other electrical equipment. Harold M. Quayle, 220 Central Avenue, heads the company.

The Estate of Adolph Starke, Columbia and Sigourney streets, Brooklyn, N. Y., is in the market for a used pipe cutting off machine to cut up to 1-in. pipe.

The Newark Millwright Co., 28 Mechanic Street, Newark, advises that it does not contemplate going into the manufacture of iron and steel products but is a jobber in transmission products and millwright work. It also acts as agent and distributor for several manufacturers' lines and specializes in plant installations.

New England

BOSTON, Feb. 28.

Machine tool representatives in many instances report no increase in business, yet the aggregate sales of single tools or more by the trade in general show a slight improvement as compared with those for the previous week, and the showing for February unquestionably will be much more satisfactory than that for January. The Manomet Mills, New Bedford, Mass., textiles, has purchased one wet and one dry grinder, a grindstone frame, a 14-in. sensitive drill, a power hack saw and three woodworking tools. The Maine Central, Bangor & Aroostook and Boston & Albany railroads have issued small lists, purchases against which will depend largely on whether the companies receive compensation from the Government. The Morgan Construction Co., Worcester, Mass., is in the market for two 24-in. lathes for turning shafting, a manufacturer of silverware wants a shaper and there are numerous other inquiries on lathes, upright drills, shapers, etc., regarding which there is some disagreement as to prices.

Interesting price developments are anticipated within the near future, however, and local dealers feel business will result. One maker of lathes has reduced prices 10 per cent. A pipe machine builder has intimated prices will be lower on or about March 1, most lines of shapers have been cut 10 to 15 per cent, and manufacturers of certain planers have told representatives they can use their own judgment regarding price up to 25 per cent when a sale is in doubt, while producers of certain lathes give salesmen a leeway of about 15 per cent.

The crane market is flat. The Worthington Pump & Machinery Corporation, Cambridge, Mass., inquiry on two 5-ton special design cranes has been indefinitely withdrawn from the market.

Interest in the used tool market the past week centered in the previously mentioned Wilton auction sale, which was conducted by J. E. Conant & Co., Lowell, Mass. There was a good representation of manufacturing and selling interests, including the Kingsbury Mfg. Co., Keene, N. H., toys and drilling machines; Dyer Co., Cambridge, Mass., piston rings; De Laval Steam Turbine Co., Trenton, N. J.; Noyes-Buick Co., Boston, automobiles; Davis & Furber Machine Co., North Andover, Mass., textile machinery; Flather Mfg. Co., Nashua, N. H., cutting machinery, etc.; Springfield Tool & Machinery Co., Springfield, Mass.; L. S. Starrett Co., Athol, Mass., tools; King Pressed Steel Co., Newton, Mass.; Chisholm Scott Co., Niagara Falls, N. Y., machinery; Hill, Clarke & Co., Boston; E. A. Eddy Machinery Co., Providence, R. I.; Standard Machinery Co., New Haven, Conn.; Waltham Screw Co., Waltham, Mass.; Newton Machine Screw Co., Newton, Mass.; Cox & Sons, Bridgeton, N. J.; Saco-Lowell Shops, Boston; Lincoln Machine Co., Pawtucket, R. I.; City Machine Co., Holyoke, Mass.; R. M. Delagrange, Stonington, Conn.; Cavicchi Pol Machinery Co., Quincy, Mass.; D. H. Bemis, 121 Haverhill Street, Boston. Much of the machine tool equipment offered was previously sold to the Wilton Co. by the Fairbanks Co., Factory & Mill Supply Co., Lynd-Farquhar Co., Henry Prentiss & Co., Niles-Bement-Pond Co., Manning, Maxwell & Moore, Inc., and Chandler & Farquhar Co., all of Boston.

Machinery in good condition, as a rule, brought fairly good prices. A 42 x 42-in. New Haven Mfg. Co. iron planer brought $1425, the highest price paid for a machine at the sale. A Blanchard vertical motor driven grinder sold at $2200, while a motor driven Pratt & Whitney heavy duty vertical surface grinder went at $550, two No. 2 Brown & Sharpe surface grinders at $300 each and another at $287.50, and two J. G. Blount No. 87 bench double grinders at $75 for the two machines. Nine 15-in. x 6-ft. Monarch screw cutting engine lathes sold, two at $412.50 each, one at $387.50, three at $350 each, one at $337.50, another at $312.50 and the last at $287.50. A 14-in. x 6-ft. lathe of the same make went under the hammer at $287.50. The four 17-in. x 6 ft. Sidney Tool Co. heavy duty screw cutting engine lathes sold each brought $400, and a 15-in. x 7-ft. Rockford Tool Co. screw cutting engine lathe $350, while a 12-in. x 4-ft. J. G. Blount speed lathe was taken at $225.

The Westinghouse Lamp Co.'s plant at Middletown, Conn., is closed. When operations are resumed, the output of this branch will be confined to miniature electric light bulbs. Machinery for manufacturing larger lamps has been removed.

Work on the new four-story, $400,000 plant of the U. S. Envelope Co., Springfield, Mass., is nearing completion.

The Chapman Valve Co., Pine Street, Indian Orchard, Mass., manufacturer of gate valves for power and waterworks service, etc., is having plans prepared for a new one-story foundry, 50 x 275 ft., with two ell extensions, 20 x 80 ft. each. The different departments will include annealing furnaces, ovens, sand blast room and wood-working shop. The Associated Architectural & Engineering Co., 145 State Street, Springfield, Mass., is architect.

The Boylston Garage, Inc., Boston, is having plans prepared for a six-story service plant and repair works on Boylston Street, 48 x 135 ft., to cost about $500,000 with machinery. J. C. Spoffard, 36 Bromfield Street, is architect.

The Old Colony Foundry Co., Cook Street, East Bridgewater, Mass., is planning for a one-story addition. Alterations and improvements will also be made to the present building. Charles L. Nutter is treasurer.

The Star Auto Radiator Co., Worcester, Mass., now occupying space at the Warren Garage, has leased property at 16-20 Washington Square, for the establishment of a new sheet-metal working plant. The present shop will be removed to this location and new equipment installed. Harry Mendell is head.

George Barth, and Frank and Philip Scannell, operating the Scannell Boiler Works, Lowell, Mass., have organized the Lowell Iron & Steel Co. Property has been acquired on Tanner Street for new works.

The Hartford-Buick Co., 51 Elm Street, Hartford, Conn., has awarded a contract to the Austin Co., 217 Broadway, New York, for a new service building and repair shop on Connecticut Road to cost about $125,000.

Joseph W. Mawson and John Broadbent, Providence, R. I., operating the M. B. S. Co., with machine shop at 9 Winter Street for the manufacture of machinery and parts, have dissolved partnership. The business will be continued under the present name by Mr. Mawson.

Lombard & Co., Inc., Boston, has been incorporated with a capital of $350,000 by John H., Walter L., and William H. McGill, 21 Oxford Street, Winchester, Mass., to manufacture machinery, tools, grinding wheels, etc.

The P. & A. Shop, 522 Main Street, Holyoke, Mass., has filed notice of organization to operate a general machine works for the manufacture of machine parts, tools, etc. Arthur Daehn and Paul C. Schubach head the company.

The United Electric Service Co., Springfield, Mass., has been incorporated with a capital of $100,000 by Edward A. Higney, Palmer, Mass., and John G. Waddell and Charles J. Weston, Springfield, to manufacture electrical appliances and equipment.

The Gill Piston Ring Co., Hartford, Conn., has been organized by L. F. Robinson, 45 Forest Street, and F. W. Cole, 28 Atwood Street, to manufacture piston rings and other machined products.

The Mooer's Falls Co., Manchester, N. H., recently organized, has preliminary plans under way for the construction of a large hydroelectric generating plant at Mooer's Falls, on the Merrimac River. Herman F. Straw, Walter M. Parker and Frank S. Carpenter, all of Manchester, head the company.

Plans are being drawn by Monks & Johnson, Boston, for a new foundry contemplated by the Builders Iron Foundry Co., Providence, R. I. Full details are not available.

Bids have been taken for the two-story, 50 x 125 ft. addition to the plant of the Portsmouth Auto Body Co., Portsmouth, N. H. It has practically covered its machinery requirements, but may later be in the market for a few tools.

Work will soon start on a one-story, 155 x 160 ft. brass mill for the Scovill Mfg. Co., Waterbury, Conn., the estimated cost of which is $100,000.

The Play-O-Lite Co., formerly of Buffalo, has moved to Worcester, Mass., and has incorporated under the laws of that State with a capital of $15,000 to manufacture electric lamps. It will locate at 215 Front St. in the near future. Allen Frazer, sales manager Wickwire-Spencer Steel Corporation, is president. Harry W. Goddard and George M. Thompson, also of the Wickwire-Spencer Steel Corporation, are associated with Mr. Frazer.

Philadelphia

PHILADELPHIA, Feb. 28.

The Elwood Ivins Tube Works, Oak Lane, Philadelphia, manufacturer of tubing, piping, etc., will take bids at once for a one-story brick addition.

The Fretz Brass & Copper Co., Philadelphia, has leased property at 535 Arch Street for a new local establishment.

The Prest-O-Lite Co., Inc., Perry Building, Philadelphia, manufacturer of acetylene equipment, has awarded a contract to the Blaw-Knox Co., Commonwealth Building, for the construction of ten one-story buildings and one two-story building on Roxborough Street, for new local works.

Fire, Feb. 17, at the plant of the Atlantic Refining Co., Thirty-fifth Street and River Road, Philadelphia, caused a loss of about $100,000, including equipment.

The War Department, Washington, is perfecting plans for the sale of the plant of the Worthington Pump & Machinery Co., Hazleton, Pa., now idle, used through the war for the manufacture of shells.

The Traver Engineering Co., Inc., College Hill, Pa., has been incorporated with a capital of $50,000 to manufacture mechanical specialties. G. W. Sweeney, Beaver Falls, Pa., is treasurer.

The Penn Silk Machine Co., Bloomsburg, Pa., has been incorporated with a capital of $50,000 to manufacture textile machinery and parts. Paul Z. Harmon, Bloomsburg, is treasurer.

The Susquehanna Collieries Co., Wilkes-Barre, Pa., is planning to rebuild its coal breaker No. 5, partially destroyed by fire, Feb. 18, with loss reported at about $25,000.

The Tunnessen Mfg. Co., Seventh and McKinley streets, Hazleton, Pa., manufacturer of metal lamps, tin and other metal products, will soon take bids for a one-story addition, 48 x 172 ft., estimated to cost $50,000.

The United Shale Brick Co., Ephrata, Pa., has been incorporated with a capital of $100,000 by Milton B. Shirk, Stevens, Pa.; George W. Kinzer, Ephrata, and Maurice Roppold, Denver, Pa., to manufacture brick, tile and kindred products.

Dubbie & Zinn, manufacturers of boiler, machinery and a general line of castings, Myerstown, Pa., have just completed an addition to their foundry, 50 x 120 ft., containing a sand blast department. A 3-ton electric traveling crane and overhead monorail system has been installed.

Buffalo

BUFFALO, Feb. 28.

The Batavia Car Works, Inc., Batavia, N. Y., has awarded contract to John Lennon & Sons, Batavia, for the construction of its proposed new plant, estimated to cost about $250,000 with equipment.

The Lockport Deoxidized Bronze & Metal Co., Lockport, N. Y., has been incorporated with a capital of $30,000 by P. K. Haber, J. C. Rock and J. Zaluski, Lockport, to manufacture bronze, brass and other metal products.

The Earl R. Maltby Co., 938 Ellicott Square, Buffalo, manufacturer of roofing products, is arranging a list of machinery for installation at its proposed new plant on property recently acquired on Erie Avenue, North Tonawanda, N. Y. Three one-story buildings will be erected, 75 x 100 ft., 60 x 100 ft., and 40 x 100 ft. respectively. The works will cost about $125,000, of which approximately $50,000 will be expended for machinery.

The Caldwell Gas Utilities Co., Buffalo, has been incorporated with a capital of $1,000,000 by A. J. Gray, 165 Loring Avenue; D. W. Masterson and L. H. McClelland, Buffalo, to manufacture gas-operated equipment, burners, etc.

The Niagara, Lockport & Ontario Power Co., Marine Bank Building, Buffalo, has plans under way for a new hydroelectric generating plant on the Niagara River, below Niagara Falls. Application has been made to the Federal Power Commission for permission to build the plant and utilize the water.

The Lowry-Knise Tool Co., Syracuse, N. Y., has filed notice of dissolution under State laws.

The Waubon Garage & Mfg. Co., Rochester, N. Y., has been incorporated with a capital of $50,000 by J. J. Frawley, H. C. and E. H. Hien, Rochester, to manufacture automobile parts and operate a machine and repair works.

Chicago

CHICAGO, Feb. 28.

Late information indicates that the total purchase by the Santa Fe, mentioned in this column a week ago, aggregated about $125,000. The same railroad is contemplating buying new equipment for its shops in Los Angeles, but action will probably not be taken for several months. The Illinois Central, which withdrew a large inquiry late last year, has revived a few of the items on the list, as follows: One 30-in. engine lathe, No. 3 milling machine, 2¼-in. horizontal turret lathe, two 42-in. drilling machines, one 24-in. engine lathe, five 18-in. motor-driven emery stands, one cutter grinder, 21-in. drill, 14-in. engine lathe, 20-in. engine lathe, 42-in. vertical turret lathe and six hack saws. A large list of tools is included in the Burlington's budget for this year, but the railroad has made it plain that its purchase is uncertain and dependent on market developments. The Big Four is preparing a list for its Beech Grove, Ind., shops.

The market remains quiet so far as actual buying is concerned, but inquiries from industrials are fairly numerous and if general price reductions develop, as expected in some quarters, a moderate amount of business should result. Two further price cuts have been announced the past week. The Cincinnati Milling Machine Co. has reduced its milling machines 15 per cent, and the Browne & Sharpe Mfg. Co. has made a like reduction on its line.

The Rex Typewriter Co., Fond du Lac, Wis., has bought a 10-in. engine lathe, a 16-in. shaper and a 14-in. engine lathe, and is understood to be still in the market for a 20-in. shaper and a milling machine.

The Amalgamated Machinery Co., Chicago, has offered for sale its entire works with equipment. The plant is located at Thirty-seventh Street and Racine Avenue, and covers six acres. The equipment includes a wide variety of machine tools, motors, air compressors, blowers, overhead cranes, etc.

The D. O. James Mfg. Co., manufacturer of gears, 1120 West Monroe Street, Chicago, plans to build an addition this spring.

The Walker Axle Co. has moved from East Chicago, Ind., to the plant of the Walker Vehicle Co. at 531 West Thirty-ninth Street, Chicago.

The Floyd Mfg. Co., manufacturer of tools, 522 South Clinton Street, Chicago, has let contracts for a two-story plant, 122 x 240 ft., and a one-story power house, 35 x 60 ft., at the northwest corner of Diversey and North Harding avenues, to cost $160,000.

The Pioneer Truck Co., 10 South La Salle Street, has plans practically completed for a one and two-story plant, 300 x 600 ft., at Lafayette, New and Campbell streets, Valparaiso, Ind., to cost $500,000.

William W. Nugent & Co., manufacturer of oiling devices, 146 West Superior Street, Chicago, has let contract for a one-story factory, 50 x 125 ft., at 410-412 North Hermitage Avenue, to cost $20,000.

The Smith & Furbach Machine Co. has leased the sixth floor of the building at 158-160 West Whiting Street, Chicago.

The Galesburg Malleable Castings Co., Galesburg, Ill., has let contract for the construction of a plant, 80 x 500 ft., to replace the foundry destroyed by fire last fall. The new structure will cost $50,000.

Fire recently destroyed all the patterns and damaged the plant of the Peoria Machinery & Tool Co., 323 South Washington Street, Peoria, Ill.

The Ferro Mfg. Co., manufacturer of automobile accessories, 2011 South Michigan Avenue, Chicago, plans to move its factory to Belvidere, Ill.

The Weil-McLain Co. foundry and machine shop, now under construction at Michigan City, Ind., will be ready to commence operations about April 1.

The Grand Rapids Malleable Works, Grand Rapids, Mich., has been granted a permit to erect a $25,000 addition.

Orlando A. Pecchia, 2646 Fullerton Avenue, Chicago, has purchased 125 ft. of frontage on Armitage Avenue between Harding and Springfield avenues, as the site for a projected automobile body factory. A one-story building containing 13,200 sq. ft. of floor space is planned.

The Crawford Steel Corporation, 341 North Crawford Avenue, Chicago, has been incorporated with a capital of $100,000 by Aaron E. Rosenthal, Richard W. Paltridge and Eric Winters, to manufacture iron and steel products.

Madison S. Jordan and Ralph L. Corey, 231 North Wells Street, Chicago, have organized the Mutual Mfg. Co., to manufacture tools and devices, mechanical equipment, etc.

The Mulberry Foundry & Machine Co., Mulberry, Kan., has plans under way for a new one-story foundry and machine shop, 75 x 100 ft., to cost about $75,000 with machinery. G. J. Munn, 307 West Seventh Street, Pittsburg, Kan., is architect.

The Stewart-Warner Speedometer Corporation, 1828 Diversey Boulevard, Chicago, has acquired the speedometer business and certain other assets of the Van Sicklen Speedometer Co., Elgin, Ill., and in the future will control this department of the output. The acquisition does not include the capital stock of the Van Sicklen company, and the organization will retain its corporate entity. The purchasing company has arranged for a bond issue of $2,000,000, the larger part of the proceeds to be used for the acquisition of the Van Sicklen interests.

The Independent Screw Corporation, 3018 West Twenty-first Street, Chicago, has been incorporated with a capital of $75,000 by F. A. Lahsin, C. Herbert Weaver and H. E. Bremer, to manufacture metal screws, bolts, tools, etc.

The Hannifton Mfg. Co., 621 Koman Avenue, Chicago, manufacturer of chucks and kindred machine shop equipment, has plans under way for a new factory at Knox and Wellington avenues, and will call for bids early in April. It will be two-stories, 90 x 160 ft., and is estimated to cost about $200,000 with equipment.

The Enterprise Railway Equipment Co., 209 South La Salle Street, Chicago, has been incorporated with a capital of $500,000 by W. H. Miner, George I. Haight and Argyle Campbell, to manufacture railroad cars and other railroad equipment.

Cleveland

CLEVELAND, Feb. 28.

Interest in the local machine tool trade last week centered in the Cleveland meeting of the National Machine Tool Builders' Association and this interest was more than usual among dealers because of the expectation that some action would be taken on readjusting prices. No action was taken, however, but before the meeting opened the announcement was circulated that the Brown & Sharpe Mfg. Co., Providence, R. I., and the Cincinnati Milling Machine Co., Cincinnati, had reduced prices on machine tools 15 per cent and dealers expected this action would be followed shortly by other reductions.

Locally the market continues dull and sales are limited to single machines, orders for the most part coming from small shops. However, the volume of business continues to improve slightly and some dealers state that their sales have doubled as compared with a month ago. The only interesting feature in the crane market is the placing of three electric traveling cranes by the Hoosier Rolling Mill Co., Terre Haute, Ind., with the Champion Engineering Co., Kenton, Ohio.

Conditions in the metal-working industry are showing some improvement, due largely to an increased activity by automobile companies, which has resulted in the release of some orders for automobile parts that were held up several months ago.

The David Lupton Sons Co., Philadelphia, has purchased from the H. K. Ferguson Co. a warehouse on East Eightieth Street and the Pennsylvania Railroad, Cleveland. The building contains 135,000 sq. ft. of floor space and will be used for storage purposes.

The Wilson Rubber Co., Canton, Ohio, is enlarging its plant by the erection of a three-story addition, 50 x 100 ft.

The Wilder Metal Coating & Mfg. Co., Niles, Ohio, is installing machinery in its new plant which it expects to have in operation early in March.

The National-Acme Co., East 131st Street, Cleveland, is having plans prepared for a three-story brick, steel and concrete factory, to cost about $200,000.

The Wilson Rubber Co., 1216 Garfield Avenue, S. W., Canton, Ohio, is planning for the erection of a new three-story plant, 50 x 100 ft., steel and reinforced concrete, to cost about $100,000 with machinery.

The Continental Clay Co., Zinninger Building, Canton, Ohio, is planning for the erection of a new two-story plant on local site, 105 x 285 ft., for the manufacture of tile and kindred products. The plant with machinery will cost about $350,000.

The Pioneer Rubber Co., Willard, Ohio, is having plans prepared for a two-story addition, 63 x 160 ft., to cost about $50,000. A housing development for employees will also be established at a like cost. B. O. Smith is president.

Cincinnati

CINCINNATI, Feb. 28.

Part at least of the Sante Fe purchases of machine tools will be made in this district, one local manufacturer having received an order for three engine lathes and another for two lathes. A milling machine company has also taken an order from the Japanese Government for several machines. Some inquiries are being received, but the question of price seems to be a deterrent to closing the orders. An Iowa manufacturer is in the market for about $25,000 worth of equipment for a machine shop and it is reported that the Big Four Railroad is about to issue a list for its Beech Grove shops. A list was put out by this road some months ago but no action has yet been taken. In connection with railroad buying, a manufacturer in close touch with the situation states that the Illinois Central will close this week on a number of tools it inquired for last fall, and that the Chicago & Northwestern and the Chicago, Milwaukee & St. Paul will be in the market about the first of April.

The Cincinnati Milling Machine Co. announced a 15 per cent reduction in the price of its milling machines and cutter grinders last week. This will not apply to attachments. No other price changes are reported.

The M. A. Hunt Co., Cincinnati, bed spring manufacturer, has awarded the contract for an extension and alterations to its plant at Dempsey Street and the Baltimore & Ohio Railroad to the J. & F. Harig Construction Co. Additional machinery will be installed.

The Cincinnati Steel Castings Co., Queen City Avenue, Cincinnati, has increased its capitalization from $100,000 to $200,000. Extensive improvements have just been completed at this plant, including the installation of a 3-ton electric furnace.

The General Machine Co., Pomeroy, Ohio, has been organized by Louis Stevens and Bernice Durst to carry on a general machine shop business. It has purchased the property formerly owned by the American Pipe Organ Co., and the machinery from the Pomeroy Machine Works.

The Bremen Metal Stamping Co., Bremen, Ohio, is contemplating the enlargement of its plant to take care of future business. The company was recently incorporated and plans are now being prepared for an addition. A. D. Hufford is president.

The plant of the Logan Clay Product Co., Logan, Ohio, manufacturer of sewer tile, was destroyed by fire Feb. 16 with an estimated loss of $25,000. The company employed over 100 men. No decision has been reached yet as to whether the plant will be rebuilt.

The Garrison Gear Grinder Co., Dayton, Ohio, has been incorporated with a capitalization of $50,000 by O. Garrison, E. A. Tucker, A. M., J. R. and B. M. Garrison.

The Jeffrey Mfg. Co., North Fourth Street, Columbus, Ohio, is having plans prepared for a one-story factory, 125 x 350 ft., to cost about $250,000 with equipment. J. Deardorff is architect.

In connection with its new paper mill and box factory at Delaware, Ohio, the Fairfield Paper Box Co., Baltimore, Ohio, will build a one-story power plant. The project will cost about $160,000. T. D. Griley is manager.

Detroit

DETROIT, Feb. 28.

Inquiries and orders for machine tools the past week showed a slight increase, with sales confined almost entirely to single machines.

The C. E. Rogers Co., of Detroit, has opened a new department for the manufacture of brass castings for automobiles. For several years it confined its activities to the manufacture of copper vacuum pans and recently moved from 34 Goldsmith Street to a new plant at 34 Witt Street, containing 25,900 sq. ft. of floor space.

The Bollstrom Motors, Inc., St. Louis, Mich., has severed its connection with the Bollstrom Engineering Co., and henceforth will be a separate concern.

The Northrup Lock Co., Brighton, Mich., is expected to start operations within the next 60 days. It is a new company and will manufacture other kinds of hardware besides locks.

The Ideal Power Mower Co., Lansing, Mich., is increasing its operations and contemplates enlarging its facilities.

The Owen-Ames-Kimball Co. has been awarded contract for construction of the coal pulverizing plant of the Grand Rapids Malleable Iron Works, Grand Rapids, Mich., to cost about $35,000.

The Illinois Tool Co., Marysville, Mich., will erect two factory buildings.

C. W. Hodges, Galesburg, Mich., has bought all the holdings of Henry Lane in the Kalamazoo Chain Co., Galesburg. The name of the concern will be changed to the Hodges Chain Co., and a complete line of tire chains and chains for other purposes will be manufactured.

The Liberty Stamping & Mfg. Co., 401-2 Book Building, Detroit, has been incorporated with a capital stock of $20,000 by William P. Neville, president; Curtis H. Longsdorf, vice-president and treasurer, and Walter S. Scott, secretary, and is in the market for machinery and tools. Its new factory is located at the Pennsylvania Railroad and Coon Avenue, and is expected to be completed in 10 days.

The Wheel Truing Brake Shoe Co., 219 Tuxedo Avenue, Detroit, has arranged a list of equipment for installation in its proposed new two-story plant, 50 x 80 ft., estimated to cost about $30,000. J. M. Griffin is president; J. & P. Kasurin, 512 Empire Building, are architects.

G. H. and A. F. deVigan, 1025 James Campeau Avenue, Detroit, have organized the Universal Headlight Controller Co., to manufacture headlight equipment and controlling devices for automobile service.

The Leitch-Nelson Co., Detroit, has been incorporated with a capital of $100,000 by John H. Leitch, A. H. Hagstrom and Anthony Nelson, 665 Hancock Avenue, West, to manufacture automobile mechanical equipment and airplane parts.

The Triangle Motor Truck Co., St. Johns, Mich., has preliminary plans under way for enlargements in its plant.

The Zenith Foundry Co., Detroit, is arranging for the early occupancy of its new plant now nearing completion for the manufacture of light gray iron castings. It represents an investment of about $200,000. Stanley Leech is president and Robert R. Snow, foundry superintendent.

The Level Road Machine Co., Stambaugh, Mich., has been incorporated with a capital of $25,000 by Carl Anderson, Erland Carlson and Axel Wettervik, Stambaugh, to manufacture special road machinery.

Indiana

INDIANAPOLIS, Feb. 28.

The Visible Pump Co., 402 Central Building, Fort Wayne, Ind., is completing plans for its new one and two-story plant at New Haven, Ind., 80 x 80 ft. and 80 x 120 ft. respectively, for the manufacture of gasoline pumps and pumping equipment. A. Z. Polhamus is president and general manager.

Harry G. Barker, 647 East Forty-second Street, Indianapolis, has had plans prepared for a one-story machine works and automobile repair shop, 60 x 130 ft., at 4206-10 College Avenue, to cost about $20,000.

The Dill Foundry Co., Rushville, Ind., has plans under way for a one-story addition. It was recently incorporated and is now occupying a building erected last year. H. G. Francis is president and William Dill, secretary and treasurer.

E. J. Schneider, 1049 Blaine Avenue, Indianapolis, has completed plans for the erection of a one-story machine shop at Ray and Harding streets, to cost about $12,000.

The Hurst Airplane Co., Evansville, Ind., has arranged for the immediate removal of its local plant to a building at Henderson, Ky., where increased manufacturing facilities will be provided. It has been maintaining headquarters at Terre Haute, Ind., and these will be removed to the new location.

Baltimore

BALTIMORE, Feb. 28.

The Maryland Culvert & Metal Co., Munsey Building, Baltimore, is planning for the erection of an addition to its plant on Ridgely Street for the manufacture of corrugated culverts and kindred products. William G. Baker is president.

The Allied Rubber Companies, Inc., Calvert Building, Baltimore, has been incorporated with a capital of 500,000 shares of stock, no par value, by William Leary, James A. Curtis and Leslie E. Mihm, to manufacture mechanical rubber goods.

C. P. Parish, 1647 West Broad Street, Richmond, Va., will establish a new machine shop and automobile repair works, and has arranged a list of equipment to be installed.

Hoisting machinery, link chain conveying equipment and other transmission equipment will be installed in the new fertilizer manufacturing plant to be erected by the Phospho-Germ Mfg. Corporation, Richmond, Va., to replace its factory recently destroyed by fire. Plans have been completed for the building, to be 66 x 76 ft.

The Ordnance Board of the War Department, Washington, has selected a site at Aberdeen, Md., for the proposed new arsenal in this section, estimated to cost about $5,500,-

000. It will be designed as a central arsenal for all departments of operation.

A. L. Flint, general purchasing officer, Panama Canal, Washington, will take bids up to 10:30 a. m., March 12, for material for the Panama Canal Zone, including brass tubing; brass, copper and bronze sheets; valves; pipe fittings; wrenches; files; reamers; pulleys; locks; hinges; steel pins; insulated wire and cable, etc., as set forth in Circular 1437.

The United States Sheet Metal Works, Inc., Wilmington, Del., has been incorporated with a capital of $50,000 by George L. Townsend, Jr., 500 Ford Building; Edmund P. Moody and D. L. Broughton, Wilmington, to manufacture metal goods.

The Kelly-Springfield Tire Co., Akron, Ohio, will begin production at its new plant at Cumberland, Md., April 1, following construction of different buildings for more than two years past. It represents an investment of close to $11,000,000, and when operating at capacity will give employment to 5000.

The Bedford Pulp & Paper Co., 909 East Main Street, Richmond, Va., has plans under way for an addition to its electric power plant, comprising a complete new unit, at its works at Coleman, Va. M. E. Marcuse is president.

The Phelps Can Co., foot of Lawrence Street, Baltimore, plans the erection of a one-story factory at Fulton Avenue and Eagle Street, 113 x 178 ft., to cost $36,000.

J. A. Arthurs, Charlotte, N. C., has plans for the establishment of a machine shop and foundry.

Pittsburgh

PITTSBURGH, Feb. 28.

Business in machine tools shows little improvement. Crane builders are getting a fair number of requests for prices for estimating purposes, but there has not been an award in this district for several weeks. Directors of the International Nickel Co. are scheduled to hold a meeting in New York on March 7, which is awaited with considerable interest by crane companies and other equipment manufacturers. It is known that revised prices against the inquiry put out by this company through Frank I. Ellis, Farmers Bank Building, Pittsburgh, have been requested and must be in by the middle of this week. A request has come out for approximate prices on 21 small tools for a manual training school, but the actual inquiry is not likely to appear until the specifications have been drawn up and approved and an appropriation voted. The railroads are showing no interest in the market and such demands as are coming out from other sources are for single tools which dealers are able to supply from stock.

The United States Stamping Co., Moundsville, W. Va., has been incorporated with a capitalization of $1,000,000 to manufacture metal products. The incorporators are W. L. Gilleland, H. C. Ogden and A. C. Remke, Wheeling, and J. M. Saunders and J. A. Boyd, Moundsville.

Fire, Feb. 22, destroyed a portion of the plant of the Dudley Electric & Machine Co., East Fayette Street, Uniontown, Pa., with loss estimated at about $50,000.

The Pittsburgh Gas Appliance Mfg. Co., Pittsburgh, is being organized by Robinson Showalter, Thaddeus S. Leese and F. B. Wickersham, Jr., 1415 Park Building, to manufacture gas appliances and equipment. Application for a State charter will be made on March 12.

The Keystone Hair Insulator Co., 1243 Spring Garden Avenue, Pittsburgh, manufacturer of electrical equipment, is taking bids for a new three-story plant, 70 x 100 ft., in the vicinity of its present works. Frank F. Lyon is in charge.

The West Penn Power Co., West Penn Building, Pittsburgh, has preliminary plans under way for the proposed third unit to its electric generating plant at Springdale, Pa., to be one-story, 200 x 900 ft., and estimated to cost close to $5,000,000 with machinery. Sanderson & Porter, 52 William Street, New York, are engineers.

The Motor Supply Co., Charleston, W. Va., has been incorporated with a capital of $150,000 by George D. Cochran, I. Duffield and W. D. Harold, Charleston, to manufacture automobile equipment.

The Cumberland & Braxton Oil Co., 146 Baltimore Street, Cumberland, Md., recently organized, is planning for the installation of pumping machinery, gasoline extraction machinery, tanks and other equipment at its properties in Braxton County, W. Va. J. H. Wiegand is secretary and treasurer.

The Gulf States

BIRMINGHAM, Feb. 28.

The Unit Stove & Range Co., Belleville, Ill., has plans under way for the establishment of a factory at Birmingham for the manufacture of hot-air furnaces and kindred products. H. A. Lengfelder is head of the company and in charge.

The Andalusia Light & Power Co., Andalusia, Ala., is arranging for the installation of a new turbo-generator at its power plant and auxiliary operating electrical and mechanical equipment.

The San Antonio Public Service Co., San Antonio, Tex., has completed plans for remodeling its local electric generating plant, to include extensions in steam and electric departments, and the installation of new machinery. It recently increased its capital from $4,700,000 to $7,000,000. E. H. Kifer is vice-president and general manager.

The Nelson Concrete Culvert Co., Pontiac, Ill., recently organized with a captal of $100,000, has plans under way for a new factory at Hattiesburg, Miss., for the manufacture of metal-reinforced concrete culverts. B. R. Thompson and R. J. Orr head the company.

Clayton C. Baldwin, Fairhope, Ala., and associates are organizing a company to establish a plant in the vicinity of Mobile, Ala., for the manufacture of roofing tile and similar products. The initial works will have a capacity of about 2000 tiles per day.

John and Wale Gaida, Ennis, Tex., have organized the Gaida Tractor & Implement Co., to manufacture motor tractors for farm service and agricultural implements.

The Dantzler Foundry & Machine Works, New Orleans, La., is planning for the establishment of a branch plant at Gulfport, Miss., to manufacture road machinery. W. Graham is manager.

The D. Souter Mfg. Co., Baton Rouge, La., recently organized to manufacture fire hose holders, flanges, nipples, couplings, etc., has plans under way for the establishment of a local factory. D. Souter is president, and Fred C. Conrad, secretary and treasurer.

The T. J. Barnett Co., Palatka, Fla., recently organized, will establish a machine shop. T. J. Barnett is manager.

The manufacture of bed springs, etc., is being considered by the Jones Furniture & Storage Co., Jacksonville, Fla.

C. L. Witherspoon, San Antonio, and associates plan to build an oil refinery at Somerset with a daily capacity of 1000 bbl.

The Texas Supply Co., dealer in oil well machinery and supplies, plans to move its headquarters from Beaumont to Houston, where a site has been purchased, and will build a warehouse and machine shops. M. L. Hurvitz is president.

The Sweetwater Oil Refining Co., Sweetwater, Tex., has purchased a local site upon which it will build a refinery.

The Texas Co., Houston, plans to lay a natural gas pipe line from its wells at Elysian Fields to Marshall, Tex., a distance of 19 miles, and to construct a distributing system in Marshall.

According to Benjamin R. Enriquez, irrigation engineer of the Government of the State of Chihuahua, Mexico, with headquarters in the city of Chihuahua, plans are on foot for the construction of a dam across the San Pedro River and the building of a hydroelectric plant and irrigation system. The estimated cost is $15,000,000.

Milwaukee

MILWAUKEE, Feb. 28.

Sales of machine tools in February are reported to be the equivalent of the volume of January, considering the fewer number of business days. The principal feature of the situation has been the question of prices and a waiting attitude was adopted pending the outcome of conferences both in the basic industry and in machine tool circles. Local tool builders as a rule are carrying production forward at a rate somewhat in excess of sales in anticipation of a betterment in demand within a short time.

The Nash Motors Co., Kenosha, Wis., will break ground this week for a one-story brick and steel machine shop addition, 50 x 150 ft., which is a part of the construction program outlined for its new four-cylinder car works at Milwaukee. The general contract has been placed with the Northwestern Bridge & Iron Co., Milwaukee.

The Reliance Mfg. Co., 317 Matthews Building, Milwaukee, manufacturer of plated ware, has been dissolved as an Illinois corporation and has been reincorporated in Wisconsin with a capital stock of $50,000. Plans are being made for transferring the factory from Chicago to Milwaukee during the

spring. J. W. Meacham is president, and O. G. Meacham, secretary and treasurer.

The Schartow Iron Products Co., Racine, Wis., is being organized by F. E. Schartow, who has disposed of his interests and retired from the Schartow Mfg. Co., South Milwaukee, Wis., the name of which has since been changed to the Midland Co. The new Schartow company will erect a machine shop and purchase equipment for manufacturing hardware specialties, automotive accessories and other small goods. For the present it will buy its supplies of malleable and gray iron castings but later it intends to erect a foundry. The new factory is expected to be ready about April 1.

The Valley Iron Works, Appleton, Wis., has perfected a reorganization following the transfer of the major interest to a group headed by Ernst Mahler, general manager Kimberly-Clark Co., pulp and paper manufacturer. E. A. Peterson, formerly treasurer and general manager, has been elected president and general manager; Ernst Mahler, vice-president; W. H. Burns, secretary and sales manager; R. S. Powell, treasurer; R. A. Peterson, assistant treasurer; J. P. Frank, director. The Valley company conducts a foundry and machine shop, specializing in the manufacture of beaters and other paper and pulp mill machinery and equipment designed by Mr. Mahler. It intends to erect a new plant, but probably not until the spring of 1922.

The Green Bay Drive Calk Co., Green Bay, Wis., has let the general contract to H. J. Selmer & Co., local, for the erection of a one-story brick forge shop and stockroom, 85 x 150 ft., to replace that part of the main shop destroyed by fire recently. The company manufactures brake assemblies and other similar automotive specialties. F. J. Van Laanen is general manager.

The Safety Fender Co., Waupun, Wis., has been organized by A. H. Luebke, designer and patentee of a new type of metal bumper for automobiles and motor trucks. It has leased the former Breyer Bros. & Whiting factory and will start regular production March 15. C. Lemmenes and Garett Hull are associated with Mr. Luebke in the enterprise.

The Hummel & Downing Co., Milwaukee, has plans by O. C. Uehling, architect, 425 East Water Street, for a five-story brick and steel mill addition, 75 x 116 ft., at Webster Place and Cambridge Avenue, to cost about $175,000 with equipment. It is a manufacturer of fiber and paper boxboard, boxes and other shipping containers. John L. Barchard is general manager.

The American Seating Co., Manitowoc, Wis., has engaged Juul, Smith & Reynolds, architects, Dempsey Block, to design a four-story brick, reinforced concrete and steel factory addition, 48 x 120 ft., to be equipped for wood-working as well as finishing seating hardware. The estimated cost is $125,000.

The Board of Education, Sheboygan, Wis., has postponed until May 1 the taking of bids for the construction of the first unit of the proposed new $1,000,000 high school and vocational training institute. The architects are Childs & Smith, Chicago.

The Lloyd Mfg. Co., Menominee, Mich., manufacturer of machinery for weaving wicker furniture and similar goods, has been merged with the Heywood Bros. & Wakefield Co. of New Jersey, a $13,000,000 corporation, with offices and headquarters in Boston, Mass. The Lloyd company will continue to maintain its identity. Marshall B. Lloyd, president and general manager, has been elected a director of the Boston company and will remain in charge of the Menominee operation.

The Victor Krefl Mfg. Co., Two Rivers, Wis., recently incorporated with $75,000 capital to manufacture automotive parts, materials, specialties and accessories, has taken over the former works of the Two Rivers Plating Co., which has been merged with the Metal Ware Corporation. Some new equipment is being purchased. Victor Krefl is president and general manager.

The Auto Appliance Mfg. Co., Milwaukee, has been incorporated with a capital stock of $50,000 to manufacture devices and appliances for automobiles, trucks and tractors. The incorporators are T. M. Neldner, Ben C. Wiczniwski and Stephen W. Neldner, 697 Clinton Street, Milwaukee.

California

LOS ANGELES, Feb. 21.

The Kroyer Motors Co., Stockton, Cal., has broken ground for the first unit of its new plant, to be one-story, brick and steel, 90 x 140 ft. It will be equipped as an assembling works. Later, construction will begin on other units. H. P. Cowley is general manager.

The Pneumatic Equipment Co., Long Beach, Cal., has been incorporated with a capital of $1,000,000 by George Boedecker, H. R. Cory and L. E. Martin, all of Long Beach, to manufacture mechanical products.

The Glendale Fire Extinguisher Co., 103-A North Brand Boulevard, Glendale, Cal., has filed notice of organization. R. T. Sodestrom, 307 Hawthorne Street, and James F. McBryde, East California Street, head the company.

The Board of Supervisors, Ventura, Cal., has arranged for the establishment of a county service building and repair works for automobiles.

The Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has acquired about 12 acres between Powell Street and Sixty-second Avenue, Emeryville, Cal., for the erection of new works. It is said that preliminary plans are being prepared.

L. D. Stoff, 847 Hyde Street, San Francisco, has filed plans for the construction of a one-story and basement machine shop on South Fulton Street, to cost about $10,000.

The Economy Pattern Works & Mfg. Co., 2264 East Fifteenth Street, Los Angeles, has filed notice of organization to manufacture mechanical specialties. B. Graves Funk, 127 West Thirty-ninth Street, and Charles Reed, Jr., 1318 Palm Drive, Hermosa Beach, head the company.

The Great Western Power Co., 14 Sansome Street, San Francisco, has completed plans for the erection and completion of its new hydroelectric power plant at Plattsville, Plumas County, estimated to cost in excess of $1,000,000.

The Central South

ST. LOUIS, Feb. 28.

The Power Truck and Tractor Co., Detroit, will take bids at once for the erection of its new one-story plant, 50 x 250 ft., at Goodfellow Street and the Wabash Railroad, St. Louis, estimated to cost in excess of $100,000. The J. T. Craven Engineering Co., 904 Century Building, St. Louis, is engineer; P. G. Craven of the last noted company represents the organization in this section.

The Stewart Self-Feeder Co., Kansas City, Mo., manufacturer of machinery, has acquired about two acres improved with a factory, 80 x 110 ft., at Springfield, Mo., where it will remove its plant. The present building will be improved to accommodate the new business, and extensions will be constructed at a later date. J. W. Atkins is secretary.

The Sunshine Safety Lamp Co., 1105 McGee Street, St. Louis, manufacturer of metal lamps for industrial service, etc., has commenced the erection of the superstructure for its new one-story and basement plant, 50 x 115 ft., on Walnut Street. W. H. Hoffstot is head. R. A. Curtis, 536 Reserve Bank Building, is architect.

The Temple Machine and Foundry Co., Temple, Okla., is planning for the establishment of a new machine shop and metal working plant at Duncan, Okla., to specialize in oil-well equipment. It will remove its present works to the new location.

The Missouri-Pacific Railroad Co., St. Louis, is planning to rebuild its local machine and repair shops, recently destroyed by fire with loss estimated in excess of $100,000. E. A. Hadley is chief engineer.

The construction quartermaster, United States Government, Fort Leavenworth, Kan., has completed plans and will soon take bids for the construction of new machine works and repair plant to cost about $400,000 with equipment.

The Bibble Sand Co., Chattanooga, Tenn., has plans under way for the installation of a new sand and gravel handling and crushing plant to cost about $200,000 with machinery. George Killian is secretary and treasurer.

The Missouri Car Co., 410 Fullerton Building, St. Louis, is having plans prepared for a new plant on Ledue Road, fronting on the tracks of the Chicago, Rock Island & Pacific Railroad Co., for the manufacture of street railway car equipment. The initial buildings are estimated to cost about $150,000. J. J. O'Brien is secretary.

The Buffalo Refining Co., Yale, Okla., recently organized, has plans under way for a new refinery with initial capacity of about 1000 bbl. per day. G. W. Lillie is president and Edward M. Weist, secretary and general manager.

The Automatic Self-Leveling Clock Co., Kirkville, Mo., recently formed with a capital of $350,000 to manufacture clock mechanisms, has plans under way for the installation of machinery in a local building. The initial equipment is estimated to cost about $30,000. John A. Pixter is president, and J. T. Dodson, vice-president.

The Ideal Tractor-Cultivator Co., 608 McCall Building, Memphis, Tenn., manufacturer of motor-driven tractors and other agricultural equipment, is arranging a list of machine shop and foundry equipment for installation in a building recently acquired. R. F. Carr is president; J. P. Stanton, associated with the North Memphis Machine Works, is manager.

Current Metal Prices

On Small Lots, Delivered from Merchants' Stocks, New York City

The quotations given below are for small lots, as sold from stores in New York City by merchants carrying stocks.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipment in carload lots from mills, these prices are given for their convenience.

On a number of articles the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE under the general heading of "Iron and Steel Markets" and "Metal Markets."

Iron and Soft Steel Bars and Shapes

Bars:	Per Lb.
Refined bars, base price	3.58c. to 3.63c.
Swedish bars, base price	15.00c.
Soft steel bars, base price	3.58c. to 3.63c.
Hoops, base price	4.33c. to 4.58c.
Bands, base price	4.28c. to 4.33c.
Beams and channels, angles and tees 3 in. x ¼ in. and larger, base	3.68c. to 3.73c.
Channels, angles and tees under 3 in. x ¼ in., base	3.59c. to 3.63c.

Merchant Steel

	Per Lb.
Tire, 1½ x ½ in. and larger	3.65c.
(Smooth finish, 1 to 2½ x ¼ in. and larger)	3.85c.
Toe calk, ½ x ⅜ in. and larger	4.25c.
Cold-rolled strip, soft and quarter hard	10.00c. to 10.50c.
Open-hearth spring steel	4.70c. to 8.00c.
Shafting and Screw Stock:	
Rounds	5.50c.
Squares, flats and hex	6.00c.
Standard cast steel, base price	15.00c.
Best cast steel	20.00c.
Extra best cast steel	25.00c.

Tank Plates—Steel

¼ in. and heavier	3.88c. to 3.93c.

Sheets

Blue Annealed	Per Lb.
No. 10	4.50c. to 4.83c.
No. 12	4.55c. to 4.88c.
No. 14	4.60c. to 4.93c.
No. 16	4.70c. to 5.03c.

Box Annealed—Black

	Soft Steel C.R., One Pass Per Lb.	Wood's Refined, Per Lb.
Nos. 18 to 20	5.30c. to 5.68c.	.....
Nos. 22 and 24	5.35c. to 5.73c.	6.80c.
No. 26	5.40c. to 5.78c.	6.90c.
No. 28	5.50c. to 5.88c.	7.00c.
No. 30	5.75c. to 6.13c.	.....

No. 28, 36 in. wide, 10c. higher.

Galvanized	Per Lb.
No. 14	5.25c. to 6.23c.
No. 16	5.50c. to 6.48c.
Nos. 18 and 20	5.65c. to 6.63c.
Nos. 22 and 24	5.80c. to 6.78c.
No. 26	5.95c. to 6.93c.
No. 27	6.10c. to 7.08c.
No. 28	6.25c. to 7.23c.
No. 30	6.75c. to 7.73c.

No. 28, 36 in. wide, 20c. higher.

Welded Pipe

Standard Steel	Blk.	Galv.	*Wrought Iron*	Blk.	Galv.
½ in. Butt...	—40	—23	¾-1½ in. Butt.	— 3	+17
¾-3 in. Butt.	—44	—28	2 in. Lap.....	+ 3	+21
3½-6 in. Lap.	—39	—24	2½-6 in. Lap...	+ 1	+17
7-12 in. Lap..	—32	—15	7-12 in. Lap....	+12	+30

Steel Wire

BASED PRICE* ON NO. 9 GAGE AND COARSER	Per Lb.
Bright basic	5.75c.
Annealed soft	5.75c.
Galvanized annealed	6.50c.
Coppered basic	6.25c.
Tinned soft Bessemer	7.25c.

*Regular extras for lighter gages.

Brass Sheet, Rod, Tube and Wire

BASE PRICE

High brass sheet	19 c. to 21½c.
High brass wire	20¼c. to 22¾c.
Brass rod	16 c. to 21¾c.
Brass tube, brazed	33 c. to 36¾c.
Brass tube, seamless	22½c. to 24½c.
Copper tube, seamless	23½c. to 25½c.

Copper Sheets

Sheet copper, hot rolled, 24 oz., 22½c. to 23c. per lb. base.

Cold rolled, 14 oz. and heavier, 2c. per lb. advance over hot rolled.

Tin Plates

Bright Tin		Coke—14x20		
			Primes	Wasters
Grade "AAA" Charcoal 14x20	Grade "A" Charcoal 14x20	80 lb....	$7.80	$7.55
		90 lb....	7.90	7.65
		100 lb....	8.00	7.75
IC.. $12.00	$10.75	IC....	8.15	7.90
IX.. 13.75	12.25	IX....	9.15	8.90
IXX.. 15.25	13.75	IXX....	10.15	9.90
IXXX.. 16.50	15.08	IXXX....	11.15	10.90
IXXXX.. 18.00	16.25	IXXXX....	12.15	11.90

Terne Plates

8-lb. Coating 14 x 20

100 lb.	$8.35
IC	8.50
IX	9.50
Fire door stock	11.50

Tin

Straits pig	35c.
Bar	40c. to 45c.

Copper

Lake ingot	16c.
Electrolytic	16c.
Casting	16c.

Spelter and Sheet Zinc

Western spelter	6¾c. to 7¼c.
Sheet zinc, No. 9 base, casks	13c. open 14c.

Lead and Solder*

American pig lead	5½c. to 6 c.
Bar lead	6 c. to 7 c.
Solder, ½ and ½ guaranteed	24c.
No. 1 solder	21½c.
Refined solder	17½c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb	80c.
Commercial grade, per lb	40c.

Antimony

Asiatic	7½c. to 8½c.

Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb.	35c to 38c.

Old Metals

Prices are generally lower and business is very quiet. Dealers' buying prices are nominally as follows:

	Cents Per Lb.
Copper, heavy and crucible	10.25
Copper, heavy and wire	9.50
Copper, light and bottoms	8.00
Brass, heavy	6.50
Brass, light	5.00
Heavy machine composition	10.25
No. 1 yellow brass turnings	5.50
No. 1 red brass or composition turnings	8.00
Lead, heavy	3.25
Lead, tea	2.25
Zinc	2.50